

Final

**Site Management Plan  
Fiscal Years 2005 through 2009  
St Juliens Creek Annex  
Chesapeake, Virginia**



Prepared for  
**Department of the Navy**  
**Atlantic Division**  
**Naval Facilities Engineering Command**  
**Norfolk, Virginia**

Contract No. N62470-02-D-3052  
CTO-0010

**August 2004**

Prepared by  
**CH2MHILL**

**Final**

# **Site Management Plan Fiscal Years 2005 through 2009**

**St. Juliens Creek Annex  
Chesapeake, Virginia**

**Prepared for  
Department of the Navy  
Atlantic Division  
Naval Facilities Engineering Command**

**Under the  
LANTDIV CLEAN III Program  
Contract N62470-02-D-3052  
Contract Task Order 010**

**Prepared by**



**August 2004**

# Contents

---

<b>Acronyms and Abbreviations .....</b>	<b>v</b>
<b>1 Introduction .....</b>	<b>1-1</b>
1.1 Purpose.....	1-1
1.2 SMP Report Organization.....	1-1
<b>2 Site Background.....</b>	<b>2-1</b>
2.1 Environmental History .....	2-2
2.1.1 CERCLA Process.....	2-2
2.1.2 Facilitywide Investigations.....	2-5
2.2 Descriptions of Sites .....	2-9
2.2.1 Descriptions of Sites in the CERCLA RI/FS Process .....	2-9
2.2.2 Description of Preliminary Screening Areas (FFA Appendix B) .....	2-17
2.2.3 Sites Requiring No Further Action (FFA Appendix C) .....	2-19
<b>3 Proposed Activities for FYs 2005 through 2009 .....</b>	<b>3-1</b>
3.1 Multisite and Basewide Activities for FYs 2005 through 2009 .....	3-1
3.1.1 Preparation of the SMP Update for FYs 2006 through 2010 .....	3-1
3.1.2 Blows Creek Watershed Baseline Ecological Risk Assessment.....	3-1
3.2 Site Characterization and Remediation Activities for FYs 2005 through 2009.....	3-1
3.2.1 Site 2—Waste Disposal Area B.....	3-1
3.2.2 Site 3—Waste Disposal Area C .....	3-2
3.2.3 Site 4—Landfill D.....	3-2
3.2.4 Site 5—Burning Grounds.....	3-2
3.2.5 Site 19—Wharf Area Building 190.....	3-2
3.2.6 Site 21—Soil Staining at Building 187 .....	3-2
<b>4 Remedial Actions and Removal Actions.....</b>	<b>4-1</b>
4.1 Historic Remedial Actions and Removal Actions .....	4-1
4.1.1 Site 3—Waste Disposal Area C .....	4-1
4.1.2 Site 6—Small Arms Unit .....	4-1
4.2 Proposed Remedial Actions and Removal Actions .....	4-2
4.2.1 Site 4—Landfill D.....	4-2
4.2.2 Site 5—Burning Grounds.....	4-2
4.2.3 Site 19—Wharf Area Building 190.....	4-2
<b>5 Site Management Schedules .....</b>	<b>5-1</b>
<b>6 References .....</b>	<b>6-1</b>

## Tables

- 2-1 Summary of Environmental Studies, Investigations, and Actions Completed for IR Sites and AOCs listed in the FFA as Requiring Additional Investigation
- 2-2 Current Status of Sites, SWMUs, and AOCs
- 2-3 AOC and SWMU Buildings and Area Related Activities Summary

## Figures

- 2-1 Location of St. Juliens Creek Annex
- 2-2 Further Action Sites Location Map (*Located at end of report*)
- 2-3 No Further Action Sites, SWMUs, and Areas of Concern Location Map (*Located at end of report*)
  
- 5-1 St. Juliens Creek Annex Schedule of IR Activities for Fiscal Years 2005 through 2009
- 5-2 Primary Document Submittal Flow Chart, FFA Process
- 5-3 Secondary Document Submittal Flow Chart, FFA Process
- 5-4 Dispute Resolution Flow Chart, FFA Process



# Acronyms and Abbreviations

---

ABM	abrasive blast media
AOC	Area of Concern
BERA	Baseline Ecological Risk Assessment
BTAG	Biological Technical Assistance Group
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHF	Chemical Hazard Factor
CLEAN	Comprehensive Long-Term Environmental Action – Navy
CY	cubic yards
DDD	dichlorodiphenyldi-chloroethane
DDE	dichlorodiphenyldichloro-ethene
DDT	dichlorodiphenyltrichloro-ethane
DoD	Department of Defense
DPG	DoD Program Goal
DRMO	Defense Reutilization and Marketing Office
EE/CA	Engineering Evaluation/Cost Analysis
EPIC	Environmental Photographic Interpretation Center
ERA	Ecological Risk Assessment
ERS	ecological risk screening
FFA	Federal Facilities Agreement
FS	Feasibility Study
ft	feet, foot
FY	fiscal year
HHRA	Human Health Risk Assessment
HHRS	human health risk screening
HRS	Hazard Ranking System
IAS	Initial Assessment Study
in.	inch, inches
IRA	interim remedial action
IR	Installation Restoration
LANTDIV	U.S. Navy, Naval Facilities Engineering Command, Atlantic Division
MCL	maximum contaminant level
MPF	Migration Pathway Factor
NACIP	Navy Assessment and Control of Installation Pollutants
NAPEC	Naval Ammunition Production Engineering Center
NFA	no further action
NPL	National Priorities List

NTCRA	non-time-critical Removal Action
PA	Preliminary Assessment
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCP	pentachlorophenol
PRAP	Proposed Remedial Action Plan
QC	quality control
RAB	Restoration Advisory Board
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RF	Receptor Factor
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
ROD	Record of Decision
RRR	Relative Risk Ranking
SIMA	Shore Intermediate Maintenance Activity
SI	Site Inspection/Site Investigation
SJCA	St. Juliens Creek Annex
SPAWAR	Space and Naval Warfare Systems Command
SMP	Site Management Plan
SSA	Site Screening Assessment
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TCL	Target Compound List
TNT	trinitrotoluene
USEPA	United States Environmental Protection Agency
UTL	upper tolerance limit
UXO	unexploded ordnance
VDEQ	Virginia Department of Environmental Quality
VOC	volatile organic compound
VSI	visual site inspection

## SECTION 1

# Introduction

---

This document presents the Site Management Plan (SMP) for St. Juliens Creek Annex (SJCA) for fiscal years (FYs) 2005 through 2009. The SMP meets the requirements of the Federal Facilities Agreement (FFA) between the U.S. Navy, Naval Facilities Engineering Command, Atlantic Division (LANTDIV), Region III of the United States Environmental Protection Agency (USEPA), and Virginia Department of Environmental Quality (VDEQ) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to address environmental contamination at applicable SJCA sites. The SMP is being submitted for use by the SJCA Installation Restoration (IR) Partnering Team and its respective organizations (LANTDIV, SJCA, USEPA, and VDEQ).

## 1.1 Purpose

The SMP's purpose is to provide a management tool for LANTDIV, SJCA, VDEQ, and USEPA personnel to use in the planning, scheduling, and setting priorities of environmental remedial response activities to be conducted at SJCA under CERCLA. The SMP establishes schedules, conceptual approaches, and scopes of work to which the USEPA, VDEQ, and Navy have agreed. The schedules and work descriptions consist of:

- Detailed schedules, near-term milestones, and descriptions of proposed activities for the current FY
- Conceptual schedules and general work approaches for activities planned for FYs 2005 through 2009

The prioritization of activities and the proposed schedules were developed by the SJCA IR Partnering Team and are based on several factors:

- The Partnering Team's relative ranking of the sites with regard to the potential risks that they may pose to human health and the environment (i.e., address high-risk sites first)
- Department of Defense (DoD) Program Goals (DPGs) of having remedies in place at all "high"-priority sites by FY 2007
- Goals set by the SJCA IR Partnering Team to meet requirements of USEPA, VDEQ, LANTDIV, SJCA, and the public

The SMP is a working document that is updated yearly to maintain current documentation and summary of environmental actions at SJCA. This SMP updates and supercedes the FYs 2004 through 2009 SMP finalized in September 2003 (CH2M HILL, 2003d).

## 1.2 SMP Report Organization

This SMP consists of six sections. Section 1 establishes the purpose of the SMP. Section 2 presents a brief history of environmental activities at the base and describes each of the sites

at SJCA that are currently included in the FFA. Section 3 presents the proposed scope of work at each site where activities will be conducted during FY 2005. Section 4 summarizes historical and potential remedial and removal actions for SJCA. Section 5 presents 5-year schedules for environmental investigation and remediation activities at those sites where activities are currently planned for FYs 2005 through 2009. Section 6 lists references.

## Site Background

---

The SJCA facility is situated at the confluence of St. Juliens Creek and the Southern Branch of the Elizabeth River in the City of Chesapeake, in southeastern Virginia (Figure 2-1). The facility covers approximately 490 acres and includes administrative buildings, wharf areas to the Elizabeth River, a central heating plant, numerous nonoperational industrial facilities, and miscellaneous structures.

The facility is bordered on the north by the Norfolk and Western Railroad, the City of Portsmouth, and residential areas; on the west by residential areas; on the south by St. Juliens Creek; and on the east by the Southern Branch of the Elizabeth River (Figure 2-1). Most surrounding areas are developed and include residences, schools, recreational areas, and shipping facilities for several large industries. The Norfolk Naval Shipyard is located approximately 1.5 miles north.

St. Juliens Creek Annex began operations as a naval ammunition facility in 1849. Past operations at SJCA have included general ordnance operations involving wartime transfer of ammunitions to various other U.S. Naval facilities throughout the United States and abroad. In addition, the Annex has been involved in specific ordnance operations and processes including those involving black powder operations, smokeless powder operations, projectile-loading operations, mine loading, tracer mixing, testing operations, and decontamination operations. Decontamination was performed in, around, and under ordnance-handling facilities at SJCA in 1977, after ordnance operations had ceased (NEESA, 1981).

St. Juliens Creek Annex has also been involved in nonordnance operations, including degreasing operations; operations performed at paint shops, machine shops, vehicle and locomotive maintenance shops, pest control shops, battery shops, print shops, electrical shops, boiler plant operations, wash rack operations, potable water, and salt water fire protection systems; and fire-training operations. Many of these operations, such as locomotive maintenance and printing, have been discontinued. Materials stored at SJCA have included oil, ordnance materials, nonordnance chemicals, and disaster preparedness chemicals. Various parts of the facility are currently used to store small amounts of waste before transfer to accumulation points.

Activity at SJCA has decreased in recent years. SJCA's current primary mission is to provide a radar-testing range and various administrative and warehousing facilities for nearby Norfolk Naval Shipyard and other local Naval activities. St. Juliens Creek Annex also provides administrative offices, light industrial shops, storage facilities, Defense Reutilization and Marketing Office (DRMO) storage, Space and Naval Warfare Systems Command (SPAWAR) facilities, Shore Intermediate Maintenance Activity (SIMA) facilities, a radar testing facility, and a cryogenics school for various Naval commands.

## 2.1 Environmental History

In 1975, the DoD began a program to assess past hazardous and toxic materials storage and disposal activities at military installations. The goals of this program, now known as the IR Program, were to identify environmental contamination resulting from past hazardous materials management practices, to assess the impacts of the contamination on public health and the environment, and to provide corrective measures as required to mitigate adverse impacts to public health and the environment.

In 1976, Congress enacted the Resource Conservation and Recovery Act (RCRA) to address the potential for hazardous waste management and disposal practices to have adverse human health and environmental impacts, as well as to manage the present and future disposal of hazardous wastes. In 1980, CERCLA, or “Superfund,” was passed to investigate and remediate areas contaminated by past hazardous waste management practices.

In 1981, the DoD’s IR Program was reissued, with additional CERCLA-specified responsibilities and authorities delegated to the Secretary of Defense. The Navy subsequently restructured the IR Program to match the terminology and structure of the USEPA CERCLA Program. The current IR Program is consistent with CERCLA and applicable state environmental laws.

St. Juliens Creek Annex was listed on the USEPA National Priorities List (NPL) in July 2000. The Navy, as the lead agency, acts in partnership with the USEPA and VDEQ to address environmental investigations at the facility through the IR Program. An FFA negotiated between the Navy, the USEPA, and the VDEQ was signed in July 2004. Under the FFA, all past and future work at IR sites, Solid Waste Management Units (SWMUs), and Areas of Concern (AOCs) were reviewed and a course of action for future work requirements at each site was developed. The FFA includes specific requirements for the preparation and contents of this SMP.

The following sections provide an overview of the CERCLA process and a summary of the major multisite studies and investigations completed to date at SJCA. Subsection 2.2. discusses individual site-specific investigations and studies.

### 2.1.1 CERCLA Process

The CERCLA process objectives are to evaluate the nature and extent of contamination at a site and to identify, develop, and implement appropriate remedial actions to protect human health and the environment. The major elements of the CERCLA process are:

- Preliminary Assessment (PA)
- Site Investigation (SI)
- Remedial Investigation/Feasibility Study (RI/FS)
- Engineering Evaluation/Cost Analysis (EE/CA) and Removal Action (may be implemented at any time in the CERCLA process)
- Proposed Remedial Action Plan (PRAP) and Record of Decision (ROD)
- Remedial Design/Remedial Action (RD/RA)
- Post-Remedial Action Monitoring and Reporting
- Community Participation (implemented throughout the CERCLA process)

A brief description of each element is provided in the following subsections.

#### 2.1.1.1 Preliminary Assessment

The Preliminary Assessment (PA) begins with the initiation of concerns about a site, area, or potential contaminant source. The PA is a limited-scope assessment designed to distinguish between sites that clearly pose little or no threat to human health or the environment and those that may pose a threat and require further investigation. The PA also identifies sites requiring assessment for possible response actions. Environmental samples are rarely collected during a PA. If the PA results in a recommendation for further investigation, a Site Investigation or Site Inspection (SI) is conducted.

#### 2.1.1.2 Site Investigation

Some sites warrant preliminary or interim investigations, studies, or removal/remedial actions. If it is unclear whether a site should be included in the CERCLA RI/FS process, an SI is sometimes conducted to make a general determination if activities at the site have impacted environmental media. An SI typically includes the collection of environmental and/or waste samples to determine what hazardous substances are present at a site and to determine if they have been released to the environment.

#### 2.1.1.3 Remedial Investigation/Feasibility Study

The Remedial Investigation (RI) serves as the mechanism for collecting data to characterize site conditions, determine the nature and extent of the waste, assess risk to human health and the environment, and (if necessary) conduct treatability testing to evaluate the potential performance and cost of the treatment technologies being considered.

The Feasibility Study (FS) is the mechanism for the development, screening, and detailed evaluation of alternative remedial actions. The RI and FS can be conducted concurrently; data collected in the RI influences the development of remedial alternatives in the FS, which in turn affect the data needs and scope of treatability studies and additional field investigations. This phased approach encourages the continual scoping of the site characterization effort, which minimizes the collection of unnecessary data and maximizes data quality.

Treatability studies are performed to assist in the evaluation of a potential remedial technology. The primary objectives of treatability testing are to:

- Provide sufficient data to allow treatment alternatives to be fully developed and evaluated during the FS
- Support the remedial design of a selected alternative

The need for a treatability study, which may be conducted at any time during the process, is generally identified during the FS.

Treatability studies may be classified as either bench-scale (laboratory study) or pilot-scale (field studies). For technologies that are well-developed and tested, bench-scale studies are often sufficient to evaluate performance. For innovative technologies, pilot tests may be required to obtain the desired information. Pilot tests simulate the physical and chemical

parameters of the full-scale process and are designed to bridge the gap between bench- and full-scale operations.

#### **2.1.1.4 Engineering Evaluation/Cost Analysis and Removal Action**

Removal actions are implemented to clean up or remove hazardous substances from the environment at a specific site in order to mitigate the spread of contamination. Removal actions may be implemented at any time during the CERCLA process and are classified as either time-critical or non-time-critical. Actions taken immediately to mitigate an imminent threat to human health or the environment, such as the removal of corroded or leaking drums, are classified as time-critical removal actions. Removal actions that may be delayed for 6 months or more without significant additional harm to human health or the environment are classified as non-time-critical removal actions (NTCRAs).

For an NTCRA, an engineering evaluation/cost analysis (EE/CA) is prepared rather than the more extensive FS. An EE/CA focuses only on the substances to be removed rather than on all contaminated substances at the site. It is possible for a removal action to become the final remedial action if the risk assessment results indicate that no further remedial action is required in order to protect human health and the environment.

#### **2.1.1.5 Proposed Remedial Action Plan and Record of Decision**

A Proposed Remedial Action Plan (PRAP) presents the remedial alternatives developed in the FS and recommends a preferred remedial method. The public has an opportunity to comment on the PRAP during an announced formal public comment period. Site information is compiled in an administrative record and placed in the general IR Program information repository established at a local library for public review.

At the end of the public comment period an appropriate remedial alternative is chosen to protect human health and the environment. All parties directly involved in the restoration program (Navy, USEPA, and VDEQ) must agree on the selected alternative. The Record of Decision (ROD) document explaining the selected remedial action is issued. The public comments received during the public comment period for the PRAP are reviewed and the responses are recorded in a Responsiveness Summary in the ROD. Subsequent to the ROD, Remedial Design (RD)/Remedial Action (RA) activities are initiated if necessary.

#### **2.1.1.6 Remedial Design/Remedial Action**

The final stage in the process is the RD/RA. The RD phase is where the technical specifications for cleanup remedies and technologies are designed. The RA is the actual construction or implementation phase of the cleanup process.

Interim remedial actions (IRAs) are implemented to provide temporary mitigation of human health risks or to mitigate the spread of contamination in the environment. They are similar to removal actions and may be implemented at any time during the process. Examples of IRAs include installing a pump-and-treat system for product recovery from groundwater or installing a fence to prevent direct contact with hazardous materials.

For IRAs, a focused FS is prepared rather than the more extensive FS. As with the removal action, an IRA may become the final RA if the results of the risk assessment indicate that no further RA is required to protect human health and the environment.



### 2.1.1.7 Post-Remedial Action Monitoring and Reporting

Five-year reviews generally are required by CERCLA or program policy when hazardous substances remain onsite above levels permitting unrestricted use and unlimited exposure. Five-year reviews provide an opportunity to evaluate the implementation and performance of a remedy to determine whether it remains protective of human health and the environment. Generally, reviews are performed 5 years following the initiation of a CERCLA response action and are repeated every succeeding 5 years as long as future uses remain restricted. Five-year reviews can be performed by USEPA or the lead agency for a site, but USEPA retains responsibility for determining the protectiveness of the remedy.

### 2.1.1.8 Community Participation

The documents prepared as part of the CERCLA process under the IR program are maintained in an information repository for review by the public. The Major Hillard Library is the public repository for the SJCA administrative record. A Community Relation Plan has been developed for SJCA and a Restoration Advisory Board (RAB) has been established; comprising members of the community, local environmental group members, and state and federal officials. It meets semiannually to keep the community informed of environmental issues at SJCA.

## 2.1.2 Facilitywide Investigations

Various facilitywide studies and investigations, including preliminary studies and detailed site investigations, have been completed at SJCA in response to the Navy's IR Program. Preliminary studies conducted to identify and assess sites posing a potential threat to human health or the environment resulting from past or current operations or waste management activities include:

- Initial Assessment Study (IAS)
- Preliminary Assessment (PA)
- Phase II RCRA Facility Assessment (RFA)

As a result of the conclusions of the preliminary studies, the following investigations have been conducted at SJCA:

- Relative Risk Ranking (RRR) System Data Collection
- Environmental Photographic Interpretation Center (EPIC) Study
- Hazard Ranking System (HRS)
- Basewide Background Investigation
- Site Screening Assessment (SSA)
- Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment (RI/HHRA/ERA) for Sites 3, 4, 5, and 6

The details and results of the facilitywide investigations completed to date are summarized below.

### 2.1.2.1 Initial Assessment Study

In 1981, the Navy conducted the IAS as part of the Naval Assessment and Control of Installation Pollutants (NACIP) Program (NEESA, 1981). Its purpose was to identify and

assess sites that posed a potential threat to human health or the environment because of contamination from past handling of and operations involving hazardous materials.

Results of this study revealed that low-level concentrations of ordnance materials exist in SJCA's eastern and southern portions. The decontamination process of buildings, equipment, magazines, and burning grounds was conducted in 1977 and lowered the ordnance concentrations. However, visual inspections and analytical tests performed after decontamination indicated that low concentrations of ordnance still exist in some buildings (NEESA, 1981). Residues were also suspected from garbage burning at the Burning Grounds (Site 5) and near the swamp between Buildings 257 and 130 (Site 2), pesticide and herbicide rinsate disposal at Cross Street and Mine Road (Site 8), and ordnance waste- and rinse waters to the sediments of Blows Creek. However, the sites identified were determined not to pose a threat to human health and the environment, and no confirmation study was recommended.

#### **2.1.2.2 Preliminary Assessment**

In 1983, NUS Corporation (NUS), Superfund Division conducted a PA at seven facility sites:

- Cross and Mine (SWMU 9 [renamed Site 8])
- Building 249 (SWMU 13)
- Dump A (SWMU 1 [renamed Site 1])
- Dump B (SWMU 2 [renamed Site 2])
- Dump B Incinerator (SWMU 3 [included with Site 2])
- Dump C (SWMU 5 [renamed Site 3])
- Dump D (SWMU 6 [renamed Site 4])

Ambient air at each site was monitored for volatile organic compounds (VOCs) and radiation with an organic vapor meter and radiation meter, respectively. No readings above background were encountered, and NUS did not observe significant signs of contamination at the sites. However, the PA report mentioned that various locations on the facility were contaminated with low-level residues of pesticide and herbicide materials. A confirmation study was not proposed (A.T. Kearney, 1989).

#### **2.1.2.3 Phase II RCRA Facility Assessment**

In 1989, A.T. Kearney, Inc., and K.W. Brown and Associates, Inc., prepared a Phase II RCRA Facility Assessment (RFA). The RFA included a preliminary review of all available relevant documents and a visual site inspection (VSI) that identified 34 SWMUs and 12 AOCs (AOCs A through L). No sampling was conducted during the RFA (A.T. Kearney, 1989).

Fifteen SWMUs (4, 9, 13, 14, 15, 16, 17, 19, 20, 23, 25, 27, 32, 33, and 41) and eight AOCs (B, C, D, E, G, H, I, and J) were recommended for further action. Detailed subsurface investigations, such as RCRA Facility Investigations (RFIs), were recommended at 10 SWMUs (1, 2, 3, 4, 5, 6, 8, 24, 30, and 32) and AOC L.

#### **2.1.2.4 Relative Risk Ranking System Data Collection Report**

In April 1996, CH2M HILL submitted an RRR System Data Collection Report for SJCA to the Department of the Navy. The report contained results from soil, sediment, and groundwater sampling conducted at Sites 1 through 21 at the Annex. The goal of the

sampling effort was to gather data for the Navy to identify sites that may require further investigation and to prioritize those sites where further investigation was needed (CH2M HILL, 1996).

The RRR System uses three components to assign a relative risk to each site: Chemical Hazard Factor (CHF), Migration Pathway Factor (MPF) and Receptor Factor (RF) (CH2M HILL, 1996). No background or quality control (QC) samples were collected during the RRR data collection, and the data were not validated because they were used for screening purposes only.

#### 2.1.2.5 Environmental Photographic Interpretation Center Study and Regulatory Review

In 1995, USEPA conducted a review of historical aerial photographs of Norfolk Naval Shipyard Annexes, including SJCA (USEPA, 1995). Potential waste disposal activities were identified at SJCA.

In June 1999, USEPA, VDEQ, and the Navy jointly reviewed the EPIC and historical aerial photography of SJCA and identified 12 potential AOCs for investigation. In November 1999, a work-in-progress/site visit with representatives of the Navy, CDM Federal, VDEQ, and the Biological Technical Assistance Group (BTAG) was conducted to evaluate the 12 “EPIC AOC” locations (1 through 12). A review of the current and past conditions of each of the 12 EPIC AOC locations was also conducted using the aerial photographs to determine if sampling was warranted at any of the locations. Further desktop review and site visits were conducted by the SJCA IR Partnering Team in 2001 and EPIC AOCs 2 through 12 were recommended for no further action (NFA).

#### 2.1.2.6 Hazard Ranking System

In 1999, the USEPA assigned Tetra Tech to prepare an HRS sampling plan for SJCA to identify additional sampling locations and sample analysis necessary to complete the HRS evaluation (Tetra Tech, 1999). Twelve potential sources that may have released contaminants were identified. Twenty-one sediment samples were collected from Blows Creek, the Southern Branch of the Elizabeth River, and St. Juliens Creek in February 1999 and analyzed for Target Analyte List (TAL) and Target Compound List (TCL) constituents.

Samples SD-1 through SD-8 were collected in the Southern Branch of the Elizabeth River in close proximity to Sites 4, 19, and 20. Samples SD-9 through SD-14 were collected in St. Juliens Creek near Site 2, and SD-15 through SD-21 were collected in Blows Creek. The data were presented in the *Hazard Ranking System Documentation Record for St. Juliens Creek Annex* (Tetra Tech, 2000). The HRS document identified sample locations SD-2, SD-3, SD-4, SD-5, SDSD-11, SD-12, SD-13, SD-14, SD-20, and SD-21 as containing inorganic concentrations that met the criteria for observed releases. SD-3, SD-5, SD-13, SD-14, SD-18, and SD-21 also had concentrations of organic compounds that met the criteria for observed releases.

#### 2.1.2.7 Basewide Background Investigation

**Soil.** A soil background study was conducted in 2001 (CH2M HILL, 2001b). The objective of the investigation was to establish background concentrations of inorganics, pesticides, and polycyclic aromatic hydrocarbons (PAHs) in surface and subsurface soil for use in comparison to IR Program site data to better identify site-related constituents of concern. Fifty surface and 50 subsurface soil samples were collected in five soil types: Munden-

Tetotum, Dragston-Augusta, Bohicket, Urban-Udorthents, and Dredge Fill. Sample locations were identified in nonimpacted areas indicative of anthropogenic background conditions at SJCA. The statistical calculations for soils included central tendency and upper tolerance limits (UTLs), which are used for comparison in the risk screening process.

**Groundwater.** The background investigation conducted in 2001 included the collection of shallow (Columbia Aquifer) and deep (Yorktown Aquifer) groundwater to establish background concentrations. However, due to the limited number of groundwater monitoring wells installed, the groundwater data were inconclusive. Consequently, six additional shallow monitoring wells were installed at SJCA in 2003. Sampling locations were identified in nonimpacted areas (areas of SJCA where no current or historical industrial activities occurred) that represent underlying hydrogeologic conditions, and areas indicative of anthropogenic background conditions. Groundwater samples were collected from 11 shallow monitoring wells for the analysis of VOCs, semivolatile organic compounds (SVOCs), pesticides/polychlorinated biphenyls (PCBs), and total and dissolved inorganics. With the inclusion of historical background sample results, the background data set consists of 18 groundwater samples.

Central tendency and UTLs were statistically determined for parameters detected in shallow groundwater to be used to better identify and assess site-related contamination and to more accurately identify and manage site risks. The groundwater results have been included in a Draft Addendum (CH2M HILL, 2004b) to the *Final Background Investigation Report* (CH2M HILL, 2001b). Background for deep groundwater was not established.

#### 2.1.2.8 Site Screening Assessment Report

An SSA for eight sites (1, 8, 10, 11, 18, 19, 20, and 21) and EPIC AOCs 1 through 12 (CH2M HILL, 2002a) was finalized in April 2002. The sites were originally identified during the RFA (A.T. Kearney, 1989), and the EPIC AOCs were identified during the joint USEPA, VDEQ, and Navy review of historical facility aerial photographs (EPIC Study) in June 1999.

The SSA recommended further investigation at four sites (1, 8, 19, and 21) and EPIC AOC 1 to determine if a release had occurred and if an RI was warranted for the sites (CH2M HILL, 2002a). The Navy, in partnership with the USEPA and VDEQ, determined NFA was required for Sites 10, 11, 18, and 20 and EPIC AOCs 2 through 12. Additionally, an addendum to the SSA was submitted in January 2003 regarding a further investigation conducted at Site 1 (Waste Disposal Area A) in September 2002. The addendum documented closeout for Site 1.

#### 2.1.2.9 Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment for Sites 3, 4, 5, and 6

A Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment (RI/HHRA/ERA) Report for Sites 3, 4, 5, and 6 was completed in March 2003 (CH2M HILL, 2003b). Surface and subsurface soil, shallow and deep groundwater, sediment, and surface water samples were collected and analyzed to characterize the nature and extent of contaminants and potential human health and ecological risks posed by contaminants at each site.

The RI/HHRA/ERA concluded that there is potential risk to human and ecological receptors from exposure to chemicals in soil and upland drainage ditch sediment (primarily inorganics and PAHs); therefore, an FS was recommended to evaluate remedial alternatives. Mitigation of risk through RAs for soil would also eliminate concern for continued transport of potential contaminants to Blows Creek via the site-related drainage ditches.

No human health risk drivers were identified for the shallow Columbia Aquifer groundwater. Although human health risk drivers (primarily inorganics) were identified for the deeper Yorktown Aquifer, the SJCA IR Partnering Team risk-managed the constituents based on the concentrations of compounds, the risks identified with these compounds, and the nature of the groundwater flow conditions.

Further evaluation of the potential for adverse effects to aquatic life in Blows Creek sediment was recommended as part of a separate Baseline Ecological Risk Assessment (BERA) based on elevated chemical concentrations of inorganics, pesticides, and PAHs. Because surface water is transient at the sites and the upland ditches provide minimal ecological habitat, there was no significant risk to human health and the environment identified from direct exposure to surface water.

## 2.2 Descriptions of Sites

Table 2-1 lists each of the studies conducted to date at the sites identified in the FFA as requiring additional investigation and Table 2-2 presents the current status of each site. The locations of the RI/FS sites and preliminary screening areas are shown in Figure 2-2, those of NFA sites are shown in Figure 2-3, and AOC and SWMU buildings and area-related activities are summarized in Table 2-3.

### 2.2.1 Descriptions of Sites in the CERCLA RI/FS Process

The following sites have been identified in the FFA as requiring RI/FSs under CERCLA. The ultimate closure of each of these sites will require a ROD.

#### 2.2.1.1 Site 2—Waste Disposal Area B

Site 2 is a former waste disposal area located at the corner of St. Juliens Drive and Cradock Street, in the facility's southwestern portion. In earlier documents, Site 2 was referred to as Dump B, Landfill B, and/or SWMUs 2, 3, and 4. The waste disposal area began operating in 1921. Initially, refuse was burned onsite and used to fill an adjacent swampy area. Mixed municipal wastes, organics, inorganics, solvents, and waste ordnance may have been disposed at Site 2. The total volume of waste prior to burning is reported to have been approximately 35,185 cubic yards (CY), and it is estimated that half of this waste was disposed of prior to 1942, when an incinerator was installed to replace the open-burning practices. The waste disposal area was closed sometime after 1947 (A.T. Kearney, 1989).

Site 2 also contains abrasive blast media (ABM) from ship overhaul and repair operations though the dates of ABM disposal are not known. In 1989, the VSI during the RFA indicated that the site was used for storing heavy equipment and machinery, including tools, tires, and machinery in sheds and trailers.

In the center of Site 2 is a water body surrounded by brush, trees, and grass directly connected to St. Juliens Creek. This inlet is tidally influenced and drains surface water from adjoining land into the creek. The Site 2 topography is generally level, sloping towards the inlet and St. Juliens Creek. Groundwater flow follows the topography and flows towards the inlet and creek. Construction debris (concrete and brick) as well as ABM is visible at the site. Site 2 is bounded on the north by a parking lot and CERCLA Site 17 (former Building 278/279); on the east by a grass-covered field where Building 130 once stood; on the west by a stormwater drainage ditch and Cradock Street; and on the south by St. Juliens Road and St. Juliens Creek.

Drainage ditches are located along Cradock Street. The 2-to-3-ft-deep vegetated drainage ditches originate north of Site 2, may contain standing water, and drain Cradock Street during high-rainfall periods. The portions of the drainage ditch adjacent to the SIMA building flow through an underground stormwater pipe under the parking lot and through the northernmost culvert to the inlet. The drainage ditches south of the SIMA building enter the inlet through a culvert on the inlet's western side. An underground storm drainage system also exists that originates approximately 1,000 ft northeast of the Site 2 area and outlets to the northernmost culvert to the inlet. Surface runoff from an adjacent parking lot to the northwest of the inlet also drains directly into the inlet.

During the 1981 IAS, a drum of Pen-Strip-G (penetone) was identified in the washrack at Building 249, just north of Site 2. The IAS states that penetone was used for vehicle and equipment cleaning in the washrack and the wastewater drained to the sanitary sewer, but prior to 1976 the effluent drained to the swampy area (Site 2 inlet), which drained into St. Juliens Creek. In 1983, NUS conducted a PA, and ambient air samples were monitored for VOCs and radiation; no readings above background were encountered at Site 2.

During the 1989 RFA, stained soil associated with leaking heavy equipment stored onsite, ash, and ABM were observed on the ground surface at Site 2. An RFI was recommended at Site 2 given the high potential for release to soil, which is attributable to the waste disposal area being unlined and the moderate to high potential for release to surface water via runoff and groundwater discharge because of proximity to St. Juliens Creek. Additionally, soil sampling for inorganics was recommended in the areas of ABM to determine if hazardous constituents were associated with the material.

During the RRR data collection study in 1996, two surface soil and two groundwater samples were collected at Site 2 and analyzed for VOCs, SVOCs, pesticides/PCBs, inorganics, and nitramines. The soil samples were found to contain pesticides/PCBs and inorganics. The groundwater samples contained 2,4,6-trinitrotoluene, 1,3,5-trinitrobenzene, acetone, and several inorganics (CH2M HILL, 1996).

The RI field investigation activities conducted in 2001 included geophysical investigations, monitoring well installations, water-level monitoring, waste delineation, and the collection and analysis of surface and subsurface soil; groundwater; sediment; and surface water samples. Based on the waste delineation trenching results, historical aerial photograph reviews, and SJCA IR Partnering Team discussions, it was determined that Site 2 had not been operated as a cut-and-fill landfill. Therefore, Site 2 was reclassified as a waste disposal area. In addition, the Site 2 boundary was adjusted to reflect the extent of waste.

The RI/HHRA/ERA concluded that there is potential risk to human and ecological receptors from exposure to chemicals in soil (primarily inorganics, pesticides, and PAHs). Therefore, the evaluation of remedial alternatives, including removal and/or soil cover, was recommended to address potential risk from exposure to soil. Mitigation of risk through RAs for soil would also eliminate concern for continued transport of potential contaminants to the inlet and St. Juliens Creek. No human health risk drivers were identified for the shallow Columbia Aquifer groundwater, and because most of the shallow monitoring wells are located upgradient of historical Site 2 activities, additional investigation of shallow groundwater was recommended.

Further evaluation of the potential for adverse effects to aquatic life in the inlet sediment was recommended based on elevated chemical concentrations of inorganics, pesticides, and PAHs. Human health risk drivers were also identified in the inlet sediment. Therefore, the evaluation of remedial alternatives was recommended, including removal of impacted inlet sediment and improvement of existing wetland quality areas adjacent to the inlet through the removal of phragmites and replacement with higher-quality wetland species. Because surface water is transient, there was no significant risk to human health and the environment identified from direct exposure to surface water. However, elevated concentrations of VOCs were present in the surface water.

Based on the results of the Site 2 RI and data gaps identified, an Expanded RI was conducted from December 2003 through January 2004 and included shallow monitoring well installation and sampling to further define the nature and extent of groundwater contamination, stormwater and surface water sampling to assess the source of VOC contamination in inlet surface water, and sediment sampling in St. Juliens Creek to evaluate potential impacts from the Site 2 inlet. Significant detections of VOCs were found in groundwater samples collected from the shallow monitoring wells at Site 2. The SJCA IR Partnering Team concluded that further delineation of the nature and extent of groundwater contamination was needed. The Expanded RI results also indicated that both the stormwater system from an upgradient VOC plume at Site 21 and elevated VOCs in groundwater at Site 2 are impacting the inlet surface water. The Draft Expanded RI Report will be submitted in FY 2005 following further delineation of potentially contaminated groundwater and sediment at Site 2. An interim technical memorandum presenting the development of reference sediment data in St. Juliens Creek was submitted in June 2004.

### 2.2.1.2 Site 3—Waste Disposal Area C

Site 3 is a former waste disposal area that covers approximately 2.1 acres in SJCA's northeastern corner and is accessible by a patrol road. Review of historical aerial photographs, interpreted by EPIC, indicate that prior to use as a disposal area, the site and much of the adjacent area had been used for placement of dredge spoil material (USEPA, 1995) that reportedly originated from Blows Creek and the Southern Branch of the Elizabeth River. Site 3 was reported to consist of approximately 10 acres. In earlier documents, Site 3 was referred to as Dump C, Waste Disposal Pits, Landfill C, SWMU 5, and/or SWMU 30.

Site 3 was originally a mudflat where refuse was allowed to burn; the ash was then used to fill the area. Operations began in 1940 and continued until 1970, prior to the implementation of RCRA. Refuse disposed of at Site 3 may have included solvents, acids, bases, and mixed municipal waste in addition to trichloroethylene waste oil and oil sludges. Prior to burning,

the total volume of waste disposed of was estimated to be 27,778 CY. Refuse was burned and then extinguished daily, using water from a fire hose. Salvageable materials were removed from the site daily and every 2 weeks the site was bulldozed for compaction and leveling (NEESA, 1981). After 1970, the area was graded level and covered with grass.

Two pits at Site 3 were reportedly used for disposal of oil and oily sludge as well as for periodic burning. The locations of the waste disposal pit and waste disposal area were outlined based on historical aerial photographs taken in 1958, 1961, 1964, and 1970 and interpreted by USEPA. As identified in the photographs, the disposal pits were located along the north side of the dirt road that crosses the site diagonally. USEPA also interpreted ground scarring along the road to be possible waste disposal areas (USEPA, 1995).

In 1983, NUS conducted a PA, and ambient air samples were monitored for VOCs and radiation; no readings above background were encountered at Site 3. During the 1989 RFA, Site 3 was recommended for an RFI owing to the high potential for release to soil because of the waste disposal area being unlined and the moderate to high potential for release to surface water via runoff and groundwater discharge because of the proximity to Blows Creek.

During the RRR data collection study in 1996, two surface soil and three groundwater samples were collected at Site 3 and analyzed for VOCs, SVOCs, pesticides/PCBs, inorganics, and nitramines. The soil samples were found to contain several SVOCs, pesticides/PCBs, and inorganics. The groundwater samples contained SVOCs, nitramines, and inorganics (CH2M HILL, 1996).

According to former employees interviewed in December 2001, Site 3 was used for disposing of materials from buildings, including Buildings 89 and 190. The area was said to be used during the 1977 building decontamination at SJCA where materials from the buildings were lined up aside the gravel road.

An RI/HHRA/ERA Report was completed for Site 3 in 2003. The RI field investigation activities included geophysical investigations, installation of monitoring wells, water-level monitoring, water delineation, and the collection and analysis of surface and subsurface soil samples, groundwater samples, sediment samples, surface water samples. Debris and burned/stained soil were visually identified within 30 in. of the ground surface at Site 3. The debris area was confined along the access road, which transects Site 3, with most debris located on the north side of the road. Burned or stained soil was limited to the north side of the gravel access road (CH2M HILL, 2003c).

On the basis of the December 2001 interviews with former SJCA employees and intrusive investigations conducted as part of the RI, the extent of waste at Site 3 was determined to be substantially smaller than previously reported and not an established landfill. Therefore, the SJCA IR Partnering Team reclassified the site as a waste disposal area (CH2M HILL, 2003b). In addition, the Site 3 boundary was adjusted to reflect the extent of waste.

The RI/HHRA/ERA concluded that there is potential risk to human and ecological receptors from exposure to chemicals in soil and upland drainage ditch sediment (primarily inorganics and PAHs). Therefore, the evaluation of remedial alternatives, including removal and/or soil cover, was recommended to address potential risk from exposure to soil. Mitigation of risk through RAs for soil would also eliminate concern for continued transport of potential



contaminants to Blows Creek via the site-related drainage ditches. No human health risk drivers were identified for the shallow Columbia Aquifer groundwater. Although human health risk drivers (primarily inorganics) were identified for the deeper Yorktown Aquifer, the SJCA IR Partnering Team risk managed the constituents based on the concentrations of compounds, the risks identified with these compounds, and the nature of the groundwater flow conditions.

Further evaluation of the potential for adverse effects to aquatic life in Blows Creek sediment was recommended as part of a separate BERA based on elevated chemical concentrations of inorganics, pesticides, and PAHs. Because surface water is transient at the site and the upland ditches provide minimal ecological habitat, there was no significant risk to human health and the environment identified from direct exposure to surface water.

An EE/CA and Action Memorandum were prepared in 2002, and Phase I of the proposed NTCRA was conducted at Site 3 in the last quarter of FY 2002. The NTCRA included excavation of visible burned/stained soil and debris, as well as surrounding material posing a potential risk to human health and the environment, characterization (including unexploded ordnance (UXO) screening and removal), and nonhazardous disposal of waste and debris in a local landfill. The extent of the area removed included 3,300 CY of waste and soil. A Construction Closeout Report documented completion of the Phase I IRA (OHM/SHAW, 2003), and the confirmation sample results were presented in a removal summary report (CH2M HILL, 2003a).

A supplemental investigation of soil was conducted in February 2003 to define the extent of the Phase II NTCRA. As a result, the extent of surface soil removal was increased 10 ft radially around sample location SS19 with an additional confirmation sample required after removal. Phase II of the NTCRA was conducted in the first quarter of FY 2004 and a Construction Closeout Report documented completion of the Phase II IRA (JV I, 2004). During Phase II, approximately 9,497 CY of waste and soil were removed in the site's southern part and included upland drainage ditch soil. Confirmation samples collected as part of the Phases I and II IRA at Site 3 show that, with the exception of isolated results, the removal activities reduced concentrations to background levels, average concentrations across Site 3 to below background levels, and the risk drivers did not indicate a central tendency statistical difference from background based on population comparisons. Therefore, the confirmation samples defined the horizontal and vertical extent of removal. These conclusions were submitted in a Draft Confirmation Closeout Report in May 2004.

Based upon the complete removal of waste and soil at Site 3, the SJCA IR Partnering Team reached consensus for closure of Site 3, and it is recommended that Site 3 be closed with NFA and a no-action PRAP and ROD in FY 2005.

#### 2.2.1.3 Site 4—Landfill D

The Site 4 landfill covers an estimated 10 acres and is located approximately 500 ft south of Site 3. The site is located on dredge fill material that reportedly originated from Blows Creek and the Southern Branch of the Elizabeth River. Site 4's area was previously reported to be about 5 acres; however, a review of historical aerial photographs and site reconnaissance conducted during the RI in 2001 indicated that the extent of Site 4 is greater than previously reported, extending west from the original site boundary. In earlier documents, Site 4 was referred to as Dump D or SWMU 6 and included SWMU 7 and AOC L.

Along the eastern boundary of Site 4, a drainage ditch diverts stormwater run-on from the site into Blows Creek. An east-westward trending drainage ditch is also present along Site 4's northern boundary. This ditch appears to receive only surface water runoff from the site's northern portion as well as runoff from adjacent northern areas, which eventually discharge into the wetlands on the site's western side.

The first indication of activity at Site 4 is a trench identified on a historical aerial photograph from 1961. The trench was approximately 1,000 ft long and paralleled Blows Creek about 500 ft north of it. The original trench and others were filled with trash, wet garbage, and soil from subsequent trenches. It is not known how many trenches were eventually dug, but based on a review of historical aerial photographs, there appears to have been only two trenches.

The IAS indicated that around 1970, sanitary landfill operations began at Site 4 in the marshes of Blows Creek. Primarily trash and wet garbage were disposed of. Sanitary landfill operations continued until 1976, at which time trash and garbage were hauled to an offsite facility, and inert material was then disposed of at the landfill. The RFA indicates that refuse was disposed of at Site 4 between 1970 and 1981. The wastes managed were primarily trash, wet garbage, construction material, and outdated civil defense stores. Although the RFA indicated that some solvents, acids, bases, and PCBs were disposed of at Site 4, it is assumed that these materials were disposed of prior to 1976 because the IAS states that only inert material was disposed of after that date. Wastes disposed of at Site 4 were estimated at 1.5 million ft<sup>3</sup>. According to Base Public Works Center personnel, the PCBs most likely came from ballast containers for fluorescent light fixtures. It is not known whether or not these ballasts were sealed units.

The RFA recommended an RFI be conducted at Site 4 due to the high potential for release to soil due to the unlined nature of the waste disposal area and the moderate to high potential for release to surface water via runoff and groundwater discharge due to the proximity to Blows Creek.

In 1983, NUS conducted a PA and ambient air samples were monitored for VOCs and radiation; no readings above background were encountered at Site 4. During the RRR data collection study in 1996, two surface soil and three groundwater samples were collected at Site 4 and analyzed for VOCs, SVOCs, pesticides/PCBs, inorganics, and nitramines. The soil samples were found to contain several PAHs, pesticides/PCBs, and inorganics. Acetone and several inorganics were detected in the groundwater samples (CH2M HILL, 1996).

An RI/HHRA/ERA Report was completed for Site 4 in 2003. The RI field investigation activities included geophysical investigations, installation of monitoring wells, water-level monitoring, and the collection and analysis of surface and subsurface soil samples, groundwater samples, sediment samples, and surface water samples (CH2M HILL, 2003b).

The RI/HHRA/ERA concluded that there is potential risk to human and ecological receptors from exposure to chemicals in soil (primarily inorganics and PAHs) and elevated mercury concentrations in the adjacent drainage ditch. Therefore, an FS was recommended to evaluate remedial alternatives. Mitigation of risk through RAs for soil would also eliminate concern for continued transport of potential contaminants to Blows Creek via the site-related drainage ditches. No human health risk drivers were identified for the shallow Columbia Aquifer groundwater. Although human health risk drivers (primarily inorganics) were identified for

the deeper Yorktown Aquifer, the SJCA IR Partnering Team risk managed the constituents based on the concentrations of compounds, the risks identified with these compounds, and the nature of the groundwater flow conditions.

Further evaluation of the potential for adverse effects to aquatic life in Blows Creek sediment was recommended as part of a separate BERA based on elevated chemical concentrations of inorganics, pesticides, and PAHs. Because surface water is transient and the upland ditches provide minimal ecological habitat, there was no significant risk to human health and the environment identified from direct exposure to surface water.

The results of sampling conducted to date at Site 4 have not indicated the presence of hazardous materials. Although trenching and landfilling may have continued after 1976 (implementation of RCRA), it is believed that only municipal wastes and inert material were disposed of. In addition, no sampling to date has indicated the presence of hazardous waste.

An FS for Site 4 was completed in March 2004 (CH2M HILL, 2004c). Remedial alternatives, including no action, soil cover, RCRA Subtitle D Cap, and excavation and offsite disposal were evaluated to minimize contact of human and ecological receptors with landfill contents, reduce infiltration and leaching of contaminants from the landfill to the groundwater, and prevent surface water run-on and control surface water runoff and erosion. Based on the comparative analysis conducted as part of the FS, soil cover and removal of contaminated sediment in the upland drainage ditch were selected as the recommended remedial alternative for Site 4. A PRAP and Preliminary RD were submitted in May 2004. A ROD and Final RD is planned for submittal in FY 2004 and will be implemented in FY 2005.

#### 2.2.1.4 Site 5—Burning Grounds

Site 5 consists of approximately 3 acres located east of Cradock Street in the facility's northern portion. The site is located on dredge fill material that reportedly originated from Blows Creek and the Southern Branch of the Elizabeth River. In earlier documents, Site 5 was also referred to as SWMU 8. The site currently consists of an open field with the southwestern portion overgrown with phragmites. A significant portion of the site's south-central area is covered with a layer of gravel.

According to the IAS, the Burning Grounds operations began in the 1930s when waste ordnance materials — including black powder (mixture of charcoal, nitrate, and sulfur), smokeless powder (nitrocellulose), Explosive D (ammonium picrate), and Composition A-3 (contains RDX and wax) — were disposed of by open burning on three main pads. The RFA stated that teteryl, trinitrotoluene (TNT), fuzes, solvents, paint sludge, pesticides, and various types of refuse were also disposed of there. Reports stated that the Burning Grounds spontaneously caught fire several times in the 1970s. The amount of ordnance disposed of varied from year to year and there is insufficient information to calculate the waste volume. In 1974, 427 short tons of ordnance items were disposed of. In 1980, during the IAS, visual examination revealed ordnance residue, such as old cartridges and spacers, as well as nonordnance residue, such as broken glass. During the VSI in 1988, a faint odor of a hydrocarbon-type compound was detected upon close inspection of the soil (A.T. Kearney, 1989). The 1989 RFA recommended an RFI be conducted at Site 5 due to the high potential for release to soil due to the unlined nature of the waste disposal area and the moderate to

high potential for release to surface water via runoff and groundwater discharge due to the proximity to Blows Creek.

The Burning Grounds surface was decontaminated in mid-1977. The decontamination included equipment from buildings that had been filled with oil and straw and ignited at the Burning Grounds. Afterwards, the ground surface was covered with oil and straw and burned, the top 6 in. of soil was diced, and the ground surface was covered with oil and straw and burned again. However, a former Navy employee who worked at the Burning Grounds was interviewed and stated that no oil was burned with the straw (CDM, 1999a). After the decontamination was completed, the Naval Ammunition Production Engineering Center (NAPEC) collected samples for chemical analyses and certified decontamination; however, the level of decontamination was not specified.

During the RRR data collection study in 1996, four surface soil and four groundwater samples were collected at Site 5 and analyzed for VOCs, SVOCs, pesticides/PCBs, inorganics, and nitramines. The soil samples were found to contain several SVOCs, pesticides/PCBs, and inorganics. Three SVOCs and several inorganics were detected in the groundwater samples (CH2M HILL, 1996).

Interviews with former employees were conducted in December 2001 and indicated that asbestos piping was buried 10 ft below ground surface and that other material disposed of included tables and metal from all portions of the base. Several buildings were located to the southwest of Site 5, including a 40-mm breakdown building and a restroom. Building 272 is still standing and was used for inspections and storing pyrotechnics.

The RI/HHRA/ERA Report was completed for Site 5 in 2003. The RI field investigation activities included geophysical investigations, installation of monitoring wells, water-level monitoring, waste delineation, and the collection and analysis of surface and subsurface soil samples, groundwater samples, sediment samples, surface water samples (CH2M HILL, 2003b).

Based on the waste delineation investigation conducted as part of the RI, the extent of the Site 5 boundaries were adjusted northward to reflect the extent of waste encountered. From a comparison of historical aerial photographs with waste delineation results, it is likely that material was burned on the site's southern side and that the burned soil and debris were spread north- and eastward from the Burning Grounds (CH2M HILL, 2003b).

The RI/HHRA/ERA concluded that there is potential risk to human and ecological receptors from exposure to chemicals in soil and upland drainage ditch sediment (primarily inorganics and PAHs). Additional soil sampling was recommended in support of further evaluating remedial alternatives.

Groundwater samples collected from the shallow monitoring wells at Site 5 indicated isolated detections of inorganics at concentrations above maximum contaminant levels (MCLs). In addition, an isolated detection of RDX was found in a sample collected from a deep monitoring well. Because these results were isolated and inconsistent between the three rounds of sampling, the SJCA IR Partnering Team concluded that an additional round of groundwater samples was necessary to confirm the RI results before proceeding with a more complete assessment of remedial needs for groundwater associated with Site 5.

Further evaluation of the potential for adverse effects to aquatic life in Blows Creek sediment was recommended as part of a separate BERA based on elevated chemical concentrations of inorganics, pesticides, and PAHs. Because surface water is transient at the site and the upland ditches provide minimal ecological habitat, there was no significant risk to human health and the environment identified from direct exposure to surface water.

An Expanded RI was completed in December 2003 and included the collection and analysis of surface soil samples to fill spatial data gaps, better evaluate areas posing potential ecological risk, and evaluate potential remedial alternatives. Additionally, groundwater samples were collected from the existing monitoring wells to confirm or deny MCL exceedances of inorganics in shallow groundwater and the presence/absence of explosives in deep groundwater identified during the RI. The surface soil samples were analyzed for PAHs, pesticides, inorganics, and cyanide based on the risk drivers identified during the RI. A subset of four surface soil samples, from locations where burning was identified in historical photographs, were also analyzed for dioxins/furans.

The results, reevaluation of risk, and recommendations will be submitted in a Draft Expanded RI report in FY 2004. An FS is planned in FY 2005 in order to evaluate remedial alternatives for Site 5.

## 2.2.2 Description of Preliminary Screening Areas (FFA Appendix B)

The sites described in this section have been identified by the FFA as preliminary screening areas.

### 2.2.2.1 Site 19—Wharf Area Building 190

Building 190 was located near Building M-5, south of the mouth of Blows Creek. The 1981 IAS identified Building 190 to have handled loose ordnance materials and as heavily used for loading explosives into ammunition. From the 1940s to the 1970s, Explosive D and Composition A-3 were used at Building 190.

According to the IAS, in mid-1977 all ordnance-handling buildings were decontaminated by flushing with chemical solutions and water. Prior to decontamination, NAPEC visually inspected the facilities and collected samples for chemical analysis to develop appropriate decontamination procedures for each building. At the conclusion of the decontamination process, NAPEC visually reinspected each building, collected samples for chemical analysis, and certified that the facilities were decontaminated. However, the level of decontamination was not specified and residues of ordnance may remain (NEESA, 1981).

The RFA reported that various ordnance items had been disposed of in the area between Building M-5 and Building 190 during past ordnance management activities (A. T. Kearney, 1989). Site 19 was referred to as AOC H during the RFA, and the area was noted to contain a variety of construction rubble and facility personnel reported no knowledge of residual contamination from ordnance management operations. The RFA recommended that a determination be made as to whether residual ordnance exists and the collection of soil samples to determine possible residual contamination.

During the RRR data collection study, surface soil and groundwater samples were collected and analyzed for VOCs, SVOCs, pesticides/PCBs, inorganics, and nitramines. No nitramines were detected in the surface soil samples. Organic constituents that were

detected in surface soil included DDD, DDE, DDT, alpha chlordane, aroclor-1254, dieldrin, endrin, and several PAHs. Organic constituents detected in the groundwater sample included acetone and methylene chloride. Several inorganics were detected in both the surface soil and groundwater samples (CH2M HILL, 1996).

The RRR analytical results were used to conduct a human health risk screening (HHRS) and ecological risk screening (ERS) as part of the SSA. The SSA concluded that groundwater should be further evaluated to confirm the presence of arsenic and methylene chloride at concentrations that may pose a human health risk. Surface soil may pose a concern to human health and was also recommended for further evaluation. No further evaluation of potential ecological effects was necessary based on results of the ERS (CH2M HILL, 2002a).

Building 190 was demolished sometime after 2000. Additional concerns with Site 19 exist related to two concrete drainage culverts and a weir based on interviews with former employees and a site visit, both conducted in 2001. The concrete drainage culverts and the weir lead from former Buildings 190 and 240 through a fence towards the Southern Branch of the Elizabeth River (CH2M HILL, 2002a).

An SI was conducted at Site 19 in August 2003 and the report was finalized in June 2004. The purpose of the SI was to address data gaps from previous investigations and collect data from within the new site boundary that encompasses Building 190. Surface soil, subsurface soil, and sediment samples were collected and analyzed for VOCs, SVOCs, TCL pesticides/PCBs, inorganics, cyanide, and explosives.

Several PAHs, pesticides, and inorganics exceeded their respective background UTLs in surface and subsurface soil at Site 19. The highest concentrations were detected around the former Building 190 footprint. VOCs, SVOCs, pesticides, and inorganics were detected in the sediment samples collected at Site 19 at similar concentrations as the SJCA reference sediment concentrations. Based on the results of the HHRS and ERS, further evaluation of surface and subsurface soil at Site 19 is recommended. Additionally, a groundwater investigation is recommended to assess the impact of elevated PAHs found at a subsurface soil sample location. Further investigation at Site 19 will be conducted in fall 2004.

Although the 2001 SSA concluded that groundwater should be further evaluated to confirm the presence of arsenic and methylene chloride in the 1995 RRR sample at concentrations that pose a potential human health risk, no further evaluation of groundwater is recommended based on the sample collection method (geoprobe), unvalidated laboratory results, methylene chloride as a common lab contaminant, and no indication of elevated arsenic or methylene chloride in the site soil.

#### **2.2.2.2 Site 21—Soil Staining at Building 187**

Building 187 was a locomotive shed used for locomotive maintenance. The IAS stated that the area around the locomotive shed was saturated with oil (NEESA, 1981).

During the 1996 RRR data collection study, surface soil and groundwater samples were collected and analyzed for VOCs, SVOCs, pesticides/PCBs, and inorganics. Pesticides (DDT, DDD, and DDE), aroclor-1260, benzo(g,h,i)perylene, fluoranthene, and inorganics were detected in surface soil samples. In addition to several inorganic constituents (including cyanide), groundwater contained one SVOC and eight VOCs (including 1,1-

dichloroethane, 1,2-dichloroethene (total), 1,2-dichloropropane, acetone, carbon tetrachloride, chloroform, methylene chloride, and trichloroethene) (CH2M HILL, 1996).

The RRR analytical results were used to conduct a HHRS and ERS as part of the SSA. Based on the HHRS and groundwater exceedances of the MCL, the SSA recommended that Site 21 groundwater be further evaluated. No further action was recommended for surface soil or for evaluating potential ecological effects (CH2M HILL, 2002a). Future investigations of groundwater at Site 21 were recommended to include groundwater at Site 11 due to the proximity of the two sites.

During a July 2001 site visit by the SJCA IR Partnering Team, Building 187 was vacant. A concrete maintenance pit for servicing railcars, approximately 40 ft long by 4 ft wide, was located near the eastern side of Building 187. The floor of the building was concrete and noted to be in good condition. The tracks from the former rail lines entered the building. No drains were noted in Building 187; however, floor drains were present in the adjoining Building 248. Building 187 was demolished in 2003 and the pit was fractured and backfilled.

An SI was conducted at Site 21 in August 2003 and the report was finalized in June 2004. The SI activities included a Membrane Interface Probe (MIP) investigation to delineate the vicinity of elevated VOCs and assess the physical characteristics of the aquifer. Based on the MIP investigation results, six deep and one shallow monitoring well were installed and groundwater samples were collected and analyzed for VOCs, SVOCs, pesticides/PCBs, total and dissolved inorganics, and cyanide. Several VOCs, SVOCs, and inorganics were detected in exceedance of the background UTLs in the shallow groundwater samples collected at Site 21. VOC concentrations in shallow groundwater and arsenic concentrations in deep groundwater also exceeded MCLs.

The HHRS identified cis-1,2-dichloroethene, TCE, vinyl chloride, and RDX as chemicals of potential concern (COPCs) in shallow groundwater that require further investigation to determine if exposure would result in risks to human receptors. In deep groundwater, arsenic, chloroform, and vanadium were retained as COPCs that require further investigation.

The ERS identified TCE concentrations as indicating a potential risk if transported and discharged to St. Juliens Creek. However, based on the low frequency of detection, transport distance before discharging to surface water, absence in downgradient groundwater, and the potential for mixing and dilution; there is minimal potential for adverse effects to aquatic life from the presence of TCE in groundwater.

Further investigation of groundwater at Site 21 will be conducted in fall 2004.

### 2.2.3 Sites Requiring No Further Action (FFA Appendix C)

Forty-seven sites at SJCA were identified in the FFA for NFA. Additionally, concurrence was reached for NFA at three FFA Appendix A sites (AOCs 13, 14, and K) and two Appendix B sites (AOC 1 and Site 8) by the SJCA IR Partnering Team based on the findings detailed in the following subsections. The NFA sites are all shown on Figure 2-3.

### 2.2.3.1 AOC 13—PCP Dip Tanks

AOC 13 was identified for further evaluation during the December 2001 interview with former employees. AOC 13 is located in an open bay of Building M-3 where two pentachlorophenol (PCP) dip tanks were located on the western wall of the open bay. Conveyor belts extended through the bay wall into the tanks. It was reported that the PCP dip tanks were in operation for a period less than 2 years during the Korean War from 1951 to 1953. No known releases have occurred at this site.

During site visits conducted in 2001 and 2002 by the Tier I SJCA Partnering Team, no evidence of staining on the concrete floor or other signs of releases was observed. However, owing to a lack of information of the location of drying operations, the Tier I SJCA Partnering Team decided that the site warranted investigation. No previous investigations have been conducted at AOC 13.

An SSA was conducted at AOC 13 in August 2003 and the SSA Addendum was finalized in June 2004. Four surface and subsurface soil samples were collected and analyzed for SVOCs. Several PAHs exceeded their respective background UTLs at one surface soil location. However, no unacceptable human health or ecological risks were identified and NFA was recommended. The SJCA IR Partnering Team reached concurrence for NFA at AOC 13 in July 2004.

### 2.2.3.2 AOC 14—Building 89

AOC 14 is located at the former Building 89 location. Building 89 was used for loading projectiles, including 8-in. and 16-in. shells with Explosive D compounds.

The 1981 IAS identified Building 190 to have handled loose ordnance materials and as heavily used for loading explosives into ammunition. From the 1920s to the 1970s, Explosive D was used at Building 89 and from the 1940s to the 1970s, tetryl was also used.

According to the IAS, in mid-1977 all ordnance-handling buildings were decontaminated by flushing with chemical solutions and water. Prior to decontamination, NAPEC visually inspected the facilities and collected samples for chemical analysis to develop appropriate decontamination procedures for each building. At the conclusion of the decontamination process, NAPEC visually reinspected each building, collected samples for chemical analysis, and certified that the facilities were decontaminated. However, the level of decontamination was not specified and residues of ordnance may remain (NEESA, 1981). In July 1978, representatives of the Ordnance Environmental Support Office (OESO) and NAPEC reinspected Building 89 for Explosive D contamination and indicated that levels less than 10 parts per million (ppm) still remained in portions of the building. Further decontamination was required before the building could be used for non-ordnance operations.

During a December 2001 interview, former employees indicated that the building was used for 8-. and 16-in. shell loading of Explosive D only. The building had 4-ft walls and a large mound of soil facing the Southern Branch of the Elizabeth River for blast protection, and there was an underground storage area northwest of Building 89. Building 89 was demolished sometime after 1999 and there is no evidence that drainage lines were present within the building. No known releases have occurred at this site and no contaminant releases were identified during building demolition activities. The site is currently covered with grass.



Building 89 was demolished sometime after 1999. A review of the available maps did not indicate that drainage lines were present in the building. No known releases are associated with this site and no contaminant releases were identified during demolition activities. The site currently consists of a grass-covered field. The SJCA Partnering Team decided to investigate AOC 14 to determine the absence or presence of contamination. No previous investigations have been conducted at AOC 13.

An SSA was conducted at AOC 14 in August 2003 and the SSA Addendum was finalized in June 2004. Eight composite soil samples were collected and analyzed for VOCs, SVOCs, pesticides/PCBs, inorganics, cyanide, and explosives. Several PAHs, pesticides, and inorganics exceeded their respective background UTLs at several sample locations. Based on the HHRS, no unacceptable risks to humans exposed to constituents in soil at AOC 14 were identified. Although the ERS concluded that there may be the potential for chemicals in onsite surface soils to be transported to the Southern Branch of the Elizabeth River, it is unlikely chemicals originating from AOC 14 would reach the River. Therefore, NFA was recommended. The SJCA IR Partnering Team reached concurrence for NFA at AOC 14 in July 2004.

#### 2.2.3.3 AOC K—Former Sewage Treatment Plant

AOC K consists of the former sewage treatment plant identified during the RFA. The plant has been identified as a small sewage treatment plant located onsite in an undefined proximity to Building 318 (A.T. Kearney, 1989). No other information was available during the RFA on the description and operation of the plant. The treatment plant began operating in 1942 and discontinued operations in 1947. The waste handled at this unit reportedly included treated wastewater from the onsite barracks. Inspection of the area where this plant was thought to be located did not reveal any evidence of prior existence of the plant. U.S. Navy documentation indicates that discharge of an unspecified waste to an unnamed receptor did occur at the plant (A.T. Kearney, 1989).

The RFA recommended NFA for this AOC; however, the SJCA IR Partnering Team determined that AOC K warranted further investigation based upon the potential for mercury contamination from trickling filters that may have been part of the STP process. No previous investigations have been conducted at AOC K. An SSA was conducted at AOC K in August 2003 and the SSA Addendum was finalized in June 2004. Three surface and subsurface soil samples were collected and analyzed for mercury. Only one mercury concentration was detected slightly above the background UTL. Based on the HHRS, no unacceptable risks to humans exposed to mercury in soil at AOC K were identified. Although the ERS concluded that there is potential for mercury in surface soil to be transported to St. Juliens Creek, the mercury concentrations detected in onsite soil are approximately the same or lower than mercury concentrations detected in background surface soils. Therefore, NFA was recommended. The SJCA IR Partnering Team reached concurrence for NFA at AOC K in July 2004.

#### 2.2.3.4 AOC 1—E Street and Marsh Road Ground Scarring

AOC 1 is located in the SJCA's northernmost area, near the intersection of E Street and Marsh Road. AOC 1 was identified for investigation during the joint USEPA, VDEQ, and Navy review of historical aerial photographs (EPIC Study) of the facility in June 1999. In the EPIC study interpretation of the 1937 aerial photograph, this AOC was identified as a

possible waste disposal area. Ground scarring, both north and south of Marsh Road, was apparent in the photograph. The area north of Marsh Road was approximately 200 ft by 150 ft, and the area south of Marsh Road was approximately 125 ft by 80 ft. By 1949, the date of the subsequent EPIC photograph, the area had been developed and Buildings 181 and 182 were constructed north of and over part of the scarring. The observation of marine shell fragments in the soil during a site visit in November 1999 indicated that the area had possibly been filled with dredge material.

An electromagnetic geophysical survey and surface soil and subsurface soil sample collection were conducted in 2001 as part of the SSA. Seven of the eight anomalies observed during the geophysical survey were attributed to utilities or other underground features.

AOC 1 was included as part of the SSA in 2001 and surface and subsurface soil samples were collected from four locations. The surface and subsurface soil samples were analyzed for VOCs, SVOCs, pesticides/PCBs, inorganics, and explosives. In addition to inorganics, three pesticides, SVOCs (primarily PAHs), and one VOC were detected in the surface soil samples. Five pesticides, one PCB, SVOCs (primarily PAHs), and VOCs were measured in the subsurface soil samples. These results were used to conduct a HHRS and ERS. Based on the HHRS, the SSA recommended further evaluation of surface soil. Additional consideration for ecological impacts to Blows Creek from PAHs was also recommended. The SJCA IR Partnering Team agreed that additional desktop review of the site information was necessary to assess the status of EPIC AOC 1.

An SI, including a desktop review, of AOC 1 was conducted in August 2003 and the report was finalized in June 2004. During the SI, four surface soil samples were analyzed for SVOCs and several PAHs were detected in exceedance of the background UTLs. Based on the HHRS, no unacceptable risks to humans exposed to constituents in soil at AOC 1 were identified. The ERS results suggested very little potential for PAHs originating from AOC 1 to be transported to Blows. Therefore, NFA was recommended for AOC 1. The SJCA IR Partnering Team reached concurrence for NFA at AOC 1 in July 2004.

#### 2.2.3.5 Site 8—Cross and Mine

Site 8 is located near the intersection of Cross Street and Mine Road, adjacent to, and north of, Building 212 and across the street from Building M-1. From the 1950s to mid-1960s, the site was used for disposal of rinse water from mobile insecticide and herbicide spray trucks. It is estimated that 675,000 gallons of rinse water were discharged directly to the ground and allowed to infiltrate the soil. Although the 1981 IAS report (NEESA, 1981) stated that the area was “devoid of vegetation,” the 1989 RFA noted that the area was covered with grass (A.T. Kearney, 1989). The RFA recommended soil sampling in the areas devoid of vegetation to determine if hazardous constituents were released. In earlier documents, Site 8 was referred to as SWMU 9.

The site was included in the 1983 PA conducted by NUS. No VOCs were detected in air and no radiation was detected above background at Site 8. During the 1996 RRR data collection study, four surface soil samples and one groundwater sample were collected and analyzed for pesticides and PCBs. Pesticides detected in one or more soil samples included DDT, DDD, DDE, and endrin. No pesticides or PCBs were detected in groundwater. The RRR results were used to conduct HHRS and ERS as part of the SSA. No unacceptable risks were found to exist. However, concerns remained regarding the historical record of 675,000

gallons of pesticide rinse water discharged to the ground remained and the site was recommended for further study (CH2M HILL, 2002a).

An SI was conducted at Site 8 in August 2003 and the report was finalized in June 2004. The investigation at Site 8 consisted of the installation of direct-push probes for the collection of grab groundwater samples from just below the water table to determine the presence or absence of pesticide contamination using analytical field test kits. Based on the test kit results and previous RRR results, four shallow monitoring wells were installed and groundwater samples were collected and analyzed for pesticides/PCBs, total and dissolved inorganics, and cyanide. Pesticides were detected at low estimated concentrations and only two dissolved inorganics exceeded their respective background UTLs. Based on the HHRS, no unacceptable risks to humans exposed to constituents in soil at Site 8 were identified. The ERS results suggest a minimal potential for adverse effects to aquatic life from the presence of pesticides in groundwater. Therefore, NFA was recommended for Site 8. The SJCA IR Partnering Team reached concurrence for NFA at Site 8 in July 2004.

**Table 2-1**  
**Summary of Environmental Studies, Investigations, and Actions Completed to Date**  
**at IR Sites and AOCs Identified in the FFA as Requiring Additional Investigation**  
**St. Juliens Creek Annex**  
**Chesapeake, Virginia**

Site/AOC	Preliminary Studies			Preliminary Investigations	RI	FS	EE/CA	Removal Actions	PRAP/ROD	RD/RA
	IAS (1981)	PA (1983)	RFA (1989)							
CERCLA RI/FS Process Sites										
Site 2	X	X	X	RRR - 1996	2003					
Site 3	X	X	X	RRR - 1996	2003		2002	2002 and 2004		
Site 4	X	X	X	RRR - 1996	2003	2004				
Site 5	X		X	RRR - 1996	2003					
Preliminary Screening Areas										
Site 19	X		X	RRR - 1996 SSA - 2002 SI - 2004						
Site 21	X		X	RRR - 1996 SSA - 2002 SI - 2004						

EE/CA - Engineering Evaluation/Cost Analysis

FS - Feasibility Study

IAS - Initial Assessment Study

PA - Preliminary Assessment

PRAP - Proposed Remedial Action Plan

RA - Remedial Action

RD - Remedial Design

RFA - RCRA Facility Assessment

RI - Remedial Investigation

ROD - Record of Decision

RRR - Relative Risk Ranking

SI - Site Investigation

SSA - Site Screening Assessment

**Table 2-2  
Current Status of Sites, SWMUs, and AOCs  
St. Juliens Creek Annex  
Chesapeake, Virginia**

Current Site/ SWMU/ AOC ID	Description	Other Identifications	Current Status	Comments	Documentation of Closure
<b>Sites</b>					
Site 1	Waste Disposal Area A	Dump A; RFA - SWMU 1	NFA	Consensus for NFA by Navy, VDEQ, and USEPA in November 2002 based on RRR data and September 2002 test pit information.	Consensus for NFA as documented in an Addendum to the SSA in January 2003.
Site 2	Waste Disposal Area B	Dump B; RFA - SWMU 2	Phase II Expanded RI in progress	Final Site 2 RI submitted February in 2004. Draft Reference Sediment Tech Memo was submitted in June 2004. Draft Phase II Expanded RI Work Plan was submitted in July 2004.	
Site 2	Waste Disposal Area B Incinerator	Dump B Incinerator, RFA - SWMU 3	Phase II Expanded RI in progress	Included with Site 2.	
Site 2	Blast Grit at Waste Disposal Area B	Blast Grit Dump B; RFA - SWMU 4	Phase II Expanded RI in progress	Included with Site 2.	
Site 3	Waste Disposal Area C	Dump C; RFA - SWMU 5	Removal Action complete, Confirmation Closeout Report in progress, PRAP and ROD in progress	Final RI submitted March 2003, Final EECA completed August 2002, Phase I Removal completed September 2002, Phase II Removal completed 2004 and Final Site 3 Construction Closeout Report submitted March 2003. NFA PRAP and ROD will be submitted in 2004.	
Site 3	Waste Disposal Pits at Waste Disposal Area C	Waste Disposal Pits Dump C; RFA - SWMU 30	Removal Action complete, Confirmation Closeout Report in progress, PRAP and ROD in progress	Final RI submitted March 2003, Final EECA completed August 2002, Phase I Removal completed September 2002, Phase II Removal completed Spring 2004 and Final Site 3 Construction Closeout Report submitted March 2003. NFA PRAP and ROD will be submitted in 2004.	
Site 4	Landfill D	Dump D; RFA - SWMU 6	FS complete, PRAP, ROD, and RD in progress	Final RI submitted March 2003, Final FS submitted March 2004. Final PRAP and ROD will be submitted in 2004.	
Site 4	Old Tanks at Dump D	RFA - AOC L	FS complete, PRAP, ROD, and RD in progress	Final RI submitted March 2003, Final FS submitted March 2004. Final PRAP and ROD will be submitted in 2004.	
Site 4	Dumpster Storage at Landfill D	Dumpster storage at Dump D; RFA - SWMU 7	Recommended for NFA in the RFA	RFA - Dumpsters no longer present.	Site 4 is currently being investigated under CERCLA.
Site 5	Burning Grounds	RFA - SWMU 8	Expanded RI in progress	Final RI submitted March 2003, Draft Expanded RI WP submitted September 2003, Expanded RI Report in progress and FS will be conducted in 2005.	
Site 6	Small Items Pit	Caged Pit, RFA - SWMU 24	NFA	Final RI submitted March 2003, Final EECA completed August 2002, Removal Action completed September 2002 followed by a Close-Out Report in March 2003, and Final PRAP and ROD submitted July 2003.	NFA Final ROD signed September 2003.
Site 7	Old Storage Yard	Old Storage Yard #1; RFA - SWMU 17	NFA	Consensus for NFA in July 2001 by Navy, VDEQ, and USEPA pending debris removal. Debris at the site was removed in 4th Quarter 2002. A construction removal document was produced in 2nd Quarter 2003.	July 2001 Tier I Partnering Meeting Minutes and documented in FFA.
Site 8	Cross and Mine	RFA - SWMU 9; FFA - PSA Site 8	NFA	Consensus for NFA by Navy, VDEQ, and USEPA in July 2004.	Signature Page in Final SI (June 2004).
Site 9	Pest. Control Bldg. 249	PA - SWMU 13	NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building and documented in FFA.
Site 9	Oil Water Separator at Bldg. 249	RFA - SWMU 23	NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building and documented in FFA.
Site 9	Washrack Bldg. 249	RFA - SWMU 25	NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building and documented in FFA.

**Table 2-2  
Current Status of Sites, SWMUs, and AOCs  
St. Juliens Creek Annex  
Chesapeake, Virginia**

Current Site/ SWMU/ AOC ID	Description	Other Identifications	Current Status	Comments	Documentation of Closure
Site 10	Waste Disposal at Railroad Tracks	Hazardous Waste Disposal Area at Bldg. 13 (Railroad Tracks); RFA - SWMU 14	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
Site 10	Swale beneath Bldg. 13	RFA - SWMU 31	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
Site 11	Waste Disposal at Building 53 (formerly referenced to Bldg. 266)	RFA - SWMU 15	NFA	Consensus by Navy, VDEQ, and USEPA for NFA during a site visit in July 2001 for Site 11 and groundwater underlying site will be covered under Site 21 further study.	Consensus for NFA as documented in the November 2002 SSA.
Site 12	Sand Blast Area Bldg. 323	RFA - SWMU 16	NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building and documented in FFA.
Site 13	Waste Generation Area	RFA - SWMU 20	NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building and documented in FFA.
Site 14	Washrack Bldg. 266	None	NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building and documented in FFA.
Site 15	Fire Training Area	Fire Training Area at Bldg. 271; RFA - SWMU 27	NFA	Will be investigated under the Navy's Underground Storage Tank (UST) program and therefore, NFA under CERCLA consensus by Navy, VDEQ, and USEPA in July 2002.	July 2002 Tier I Partnering Meeting Minutes and documented in FFA.
Site 16	DRMO Storage/Salvage Yard	RFA - SWMU 28	NFA	While active, the DRMO does not fall under CERCLA and therefore, NFA under CERCLA consensus by Navy, VDEQ, and USEPA in July 2002. Regional inspections are conducted for stormwater management.	July 2002 Tier I Partnering Meeting Minutes and documented in FFA.
Site 17	Storage Pad at Building 279	Satellite storage at Bldg. 279; RFA - AOC A	NFA	The roof and walls of Building 278/279 were demolished in early 2003, the flooring and concrete pilings are still in place awaiting final removal. Based upon the proximity to Site 2, consensus in February 2003 by Navy, VDEQ, and USEPA that further action related to Site 17 will be addressed under Site 2.	February 2003 Tier I Partnering Meeting Minutes and documented in FFA.
Site 18	Blasting Grit at Building 47	RFA - AOC C	NFA	During the July 2001 SJCA Partnering Team site visit, no blast grit was observed in several hand auger borings therefore, consensus for NFA was reached by Navy, VDEQ, and USEPA.	Consensus for NFA as documented in the November 2002 SSA.
Site 18	Air Compressor at Bldg. 47	RFA - AOC B	NFA	NFA consensus by Navy, VDEQ, and USEPA in July 2002. Regional inspections are conducted for stormwater management.	July 2002 Tier I Partnering Meeting Minutes and documented in FFA.
Site 19	Wharf Area Building M-5	Residual Ordnance at Bldg. M-5 & 190 RFA - AOC H	Supplemental SI in progress	Final SI submitted in June 2004. Draft Supplemental SI Work Plan will be submitted in August 2004.	
Site 20	Wharf Area Sediments	Residual Ordnance at wharf area; RFA - AOC I	NFA	Navy Range Program will manage the site. Due to the potential for buried ordnance, signs were posted in 2003 to prohibit intrusive activities, the Navy will place a warning notice in LANTDIV Real Estate Documents, and notify the U.S. Army Corps of Engineers of the potential for UXO. During the July 2001 site visit, the Navy, VDEQ and USEPA reached consensus for NFA under CERCLA.	Consensus for NFA as documented in the November 2002 SSA.
Site 21	Soil Staining at Building 187	None	Supplemental SI in progress	Final SI submitted in June 2004. Draft Supplemental SI Work Plan will be submitted in August 2004.	

**Table 2-2  
Current Status of Sites, SWMUs, and AOCs  
St. Juliens Creek Annex  
Chesapeake, Virginia**

Current Site/ SWMU/ AOC ID	Description	Other Identifications	Current Status	Comments	Documentation of Closure
<b>SWMUs</b>					
SWMU 10	Hazardous Waste Container Storage Bldg. 254Y	None	NFA	Recommended for NFA in the RFA as SWMU 10 was assigned to RCRA Program as a >90 day storage bunker. Consensus by Navy, VDEQ, and USEPA for NFA under CERCLA in July 2002, as SWMU 10 was managed under RCRA.	July 2002 Tier I Partnering Meeting Minutes and documented in FFA.
SWMU 11	Hazardous Waste Container Storage Bldg. 163Y	None	NFA	Recommended for NFA in the RFA as SWMU 11 was assigned to RCRA Program as a >90 day storage bunker. Consensus by Navy, VDEQ, and USEPA for NFA under CERCLA in July 2002, as SWMU 11 is managed under the Virginia Hazardous Waste Management Regulations.	July 2002 Tier I Partnering Meeting Minutes and documented in FFA.
SWMU 12	PCB Storage Bldg. 198	None	NFA	Recommended for NFA in the RFA. SWMU 12 is a current storage facility managed under TSCA therefore, consensus by Navy, VDEQ, and USEPA for NFA under CERCLA in July 2002.	July 2002 Tier I Partnering Meeting Minutes and documented in FFA.
SWMU 18	Old Storage Yard # 2	None	NFA	Recommended for NFA in the RFA. Currently in operation and Regional inspections are conducted for stormwater management. Consensus by Navy, VDEQ, and USEPA for NFA under CERCLA.	FFA
SWMU 19	Old Storage Yard # 3	None	NFA	RFA recommended action for better management practice. A site visit was performed in November 2002 by Navy, VDEQ, and USEPA to confirm status and consensus for NFA under CERCLA was reached.	FFA
SWMU 21	Hazardous Waste Accumulation Area (SIMA # 2)	None	NFA	The RFA recommended NFA for this SWMU. A site visit was performed in November 2002 by Navy, VDEQ, and USEPA to confirm status and consensus for NFA under CERCLA was reached. The Navy submitted a closure notification letter to VDEQ for SWMU 21.	Closure letter submitted to VDEQ and documented in FFA.
SWMU 22	Repair Shop Satellite Storage Area NE of Bldg. 40	None	NFA	The RFA recommended NFA for this SWMU. A site visit was performed in November 2002 by Navy, VDEQ, and USEPA to confirm status and consensus for NFA under CERCLA was reached. The Navy submitted a closure notification letter to VDEQ for SWMU 22.	Closure letter submitted to VDEQ and documented in FFA.
SWMU 26	Scrap Metal Storage in Railroad Cars near Bldg. 176	None	NFA	Based on a site visit in November 2002, NFA consensus was reached by Navy, VDEQ, and USEPA, as the SWMU is managed under RCRA.	FFA
SWMU 29	Dumpsters (throughout the facility)	None	NFA	Based on a site visit in November 2002, NFA consensus was reached by Navy, VDEQ, and USEPA, as the SWMU is managed under RCRA.	FFA
SWMU 32	Overland Drainage Ditches	None	NFA	Navy, VDEQ, and USEPA reached consensus for NFA under CERCLA, as drainage ditches associated with individual sites, AOCs, or SWMUs will be investigated on a site-specific basis. Site-specific investigations will identify the exact boundaries of the drainage ditch and samples will be collected at all locations where there is either visible evidence of release or suspicion that past releases may have occurred.	FFA
SWMU 33	Sewer Drainage System	None	NFA	Navy, VDEQ, and USEPA reached consensus for NFA under CERCLA, as the sewer drainage system associated with individual sites, AOCs, or SWMUs will be investigated on a site-specific basis. Site-specific investigations will include evaluating the integrity of the subsurface system and may include soil sampling to determine if hazardous constituents have been released.	FFA
SWMU 34	Operational Waste Accumulation Areas	None	NFA	Based on a site visit in November 2002, NFA consensus was reached by Navy, VDEQ, and USEPA, as the SWMU is managed under RCRA.	FFA

**Table 2-2  
Current Status of Sites, SWMUs, and AOCs  
St. Juliens Creek Annex  
Chesapeake, Virginia**

Current Site/ SWMU/ AOC ID	Description	Other Identifications	Current Status	Comments	Documentation of Closure
<b>AOCs</b>					
AOC D	Storm Water Outfalls	None	NFA	Navy, VDEQ, and USEPA reached consensus for NFA under CERCLA, as the storm water outfalls will be investigated under CERCLA on a site-specific basis. Site-specific investigations may include sampling various outfalls to determine whether there has been a release of hazardous constituents.	FFA
AOC E	Temporary Pump Storage	None	NFA	AOC E was remediated during a removal action conducted as part of the SIMA facility construction. Therefore, the SJCA Partnering Team reached consensus for NFA for AOC E based on the removal action.	Closed out during the construction of the SIMA building and documented in FFA.
AOC F	Underground Storage Tanks	None	NFA	Navy, VDEQ, and USEPA reached consensus for NFA under CERCLA in July 2002, as AOC F is managed under the Navy's UST Program.	July 2002 Tier I Partnering Meeting Minutes and documented in FFA.
AOC G	Former Process Buildings	None	NFA	Navy, VDEQ, and USEPA reached consensus for NFA under CERCLA in July 2002 however, as new information becomes available on the locations and processes conducted at former process buildings, the SJCA Partnering Team will determine if new AOCs should be added. Any former process buildings identified for further evaluation will be evaluated on a site-specific basis.	July 2002 Tier I Partnering Meeting Minutes and documented in FFA.
AOC J	Former Ammunition Manufacturing Areas	None	NFA	Navy, VDEQ, and USEPA reached consensus for NFA under CERCLA, however, as new information becomes available on the manufacturing areas, the SJCA Partnering Team will determine if new AOCs should be added. Any former ammunition manufacturing areas identified for further evaluation will be evaluated on a site-specific basis.	FFA
AOC K	Former Sewage Treatment Plant	FFA - SSA AOC K	NFA	Consensus for NFA by Navy, VDEQ, and USEPA in July 2004.	Signature Page in Final SSA Addendum (June 2004).
EPIC AOC 1	E Street and Marsh Road Ground Scarring	AOC 1; FFA - PSA AOC 1	NFA	Consensus for NFA by Navy, VDEQ, and USEPA in July 2004.	Signature Page in Final SI (June 2004).
EPIC AOC 2	Piers in front of Building 83	AOC 2	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 3	Ground Scarring at Building M5	AOC 3	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 4	Parking Area South of Building M-1	AOC 4	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 5	Possible Soil Staining Between Buildings 87 and 88	AOC 5	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 6	Ground Scarring East of Site 2	AOC 6	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 7	City of Portsmouth Outgrant Area	AOC 7	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 8	Possible Waste Disposal/Bulk Storage Area	AOC 8	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 9	Ground Scarring Southwest of Building 74	AOC 9	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.



**Table 2-2**  
**Current Status of Sites, SWMUs, and AOCs**  
**St. Juliens Creek Annex**  
**Chesapeake, Virginia**

Current Site/ SWMU/ AOC ID	Description	Other Identifications	Current Status	Comments	Documentation of Closure
EPIC AOC 10	Ground Scarring in Wharf Area	AOC 10	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 11	Open Storage Area Northeast of Building 55	AOC 11	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 12	Sandy Flat	AOC 12	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
AOC 13	PCP Dip Tank	AOC 13; FFA - SSA AOC 13	NFA	Consensus for NFA by Navy, VDEQ, and USEPA in July 2004.	Signature Page in Final SSA Addendum (June 2004).
AOC 14	Building 89	AOC 14; FFA - SSA AOC 14	NFA	Consensus for NFA by Navy, VDEQ, and USEPA in July 2004.	Signature Page in Final SSA Addendum (June 2004).

Note: Shading indicates those Sites/SWMUs/AOCs that require No Further Action (NFA)

RFA No.	ADDITIONAL AOC/SWMU DESCRIPTION	CURRENT STATUS	PREVIOUS ACTION	ADDITIONAL ACTION
AOC D SWMU 32 SWMU 33	Outfalls 1, 2 ,3 ,4 Water Pollution Out falls Map, July 8, 1971		Rinseate and drainage from various buildings have discharged to surface water bodies via Overland Drainage Ditches (SWMU #32), Sewer Drainage System (SWMU #33), and Storm Water Outfall(s) (AOC D). The contamination migration from these buildings will be addressed as one operable unit (OU #1)	Additional information required to determine further action. Review interview information and Navy documentation of facility permit record (NWSY & NNSY) and review facility utility drawing/maps to determine probable migration routes and additional action. While OU #1 is not proposed for the SSA field investigation, the SSA report provides additional information and recommends additional investigation requirements
AOC G	Building 6	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Decontamination of Building 6 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 6 was decontaminated in the 1970's, it has been used as administration space by PWC. The Navy plans no further action (NFA) for Building 6.
AOC G	Building 7	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Decontamination of Building 7 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 7 was decontaminated in the 1970's, it has been used as storage space by NWASP. The Navy plans no further action (NFA) for Building 7.
AOC G	Building 8	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Decontamination of Building 8 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 8 was decontaminated in the 1970's, it has been used as administration space by NIF. The Navy plans no further action (NFA) for Building 8.
AOC G	Building 10	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Building 10 was not identified as requiring decontamination by the Naval Ammunition Production Engineering Center (NAPEC) in the assessment of St. Juliens Creek Annex. Based on review of documents, the Navy concludes that Building 10 was decontaminated and converted to administrative use prior to the NAPEC assessment.	Since Building 10 was decontaminated in the 1970's, it has been used as administration space by FTSCCLANT. The Navy plans no further action (NFA) for Building 10.
AOC G	Buildings 11, 62, & 63 (Inert Storage Warehouse)	Building 62 has been demolished. All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings.
AOC G	Buildings 16, 17, 38, & 40 (Smokeless Powder Storage)	All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings.
AOC G	Building 18 Fuze and Primer Renovation and Black Powder Filling	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Decontamination of Building 18 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 18 was decontaminated in the 1970's, it has been used by the Fleet Training Command (FTC) as a Cryogenics School. The Navy plans no further action (NFA) for Building 18.
AOC G	Buildings 24, 28, 141, & 251 (Bulk Black Powder Storage)	Building 141 has been demolished. All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings.
AOC G	Building 29	DEMOLISHED (after W.W.II)	Demolished after W.W.II.	The Navy plans no further action (NFA) for Building 29.
AOC G	Building 32	DEMOLISHED (after W.W.II)	Demolished after W.W.II.	The Navy plans no further action (NFA) for Building 32.
AOC G	Building 32A	DEMOLISHED (after W.W.II)	Demolished after W.W.II.	The Navy plans no further action (NFA) for Building 32A.
AOC G	Building 33	DEMOLISHED (after W.W.II)	Demolished after W.W.II.	The Navy plans no further action (NFA) for Building 33.
AOC G	Building 39 20 mm & 40 mm Breakdown Plant	Located in the Historic District	Decontamination of Building 39 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 7 was decontaminated in the 1970's, it has been used for storage. It is currently vacant and planned for demolition in FY-02. The Navy plans no further action (NFA) for Building 39.
AOC G	Building 41 20 mm & 40 mm Renovation Building	DEMOLISHED (1991)	Decontamination of Building 41 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 41 was decontaminated in the 1970's, it was used as a shipping and receiving facility for FTSCCLANT.
AOC G	Building 44 Explosive Loading into railroad tank cars (1930s)	DEMOLISHED (1982-1985)*	Decontamination of Building 44 occurred in the mid 1970s; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance	No reports of disposal or spills are documented at this location; however, these reports indicate that excess materials from ordnance processing were cleaned up and disposed of at the Burning Grounds (Site 5). Building 44 was demolished between 1982-1985. The Navy plans no further action (NFA) for Building 44.
AOC G	Building 46 Medium Caliber Cartridge Renovation and Assembly	Demolition Planned unknown date	Decontamination of Building 46 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 46 was decontaminated in the 1970's, it has been used as a machine shop with some administrative space. It is currently vacant and planned for demolition The Navy plans no further action (NFA) for Building 46.

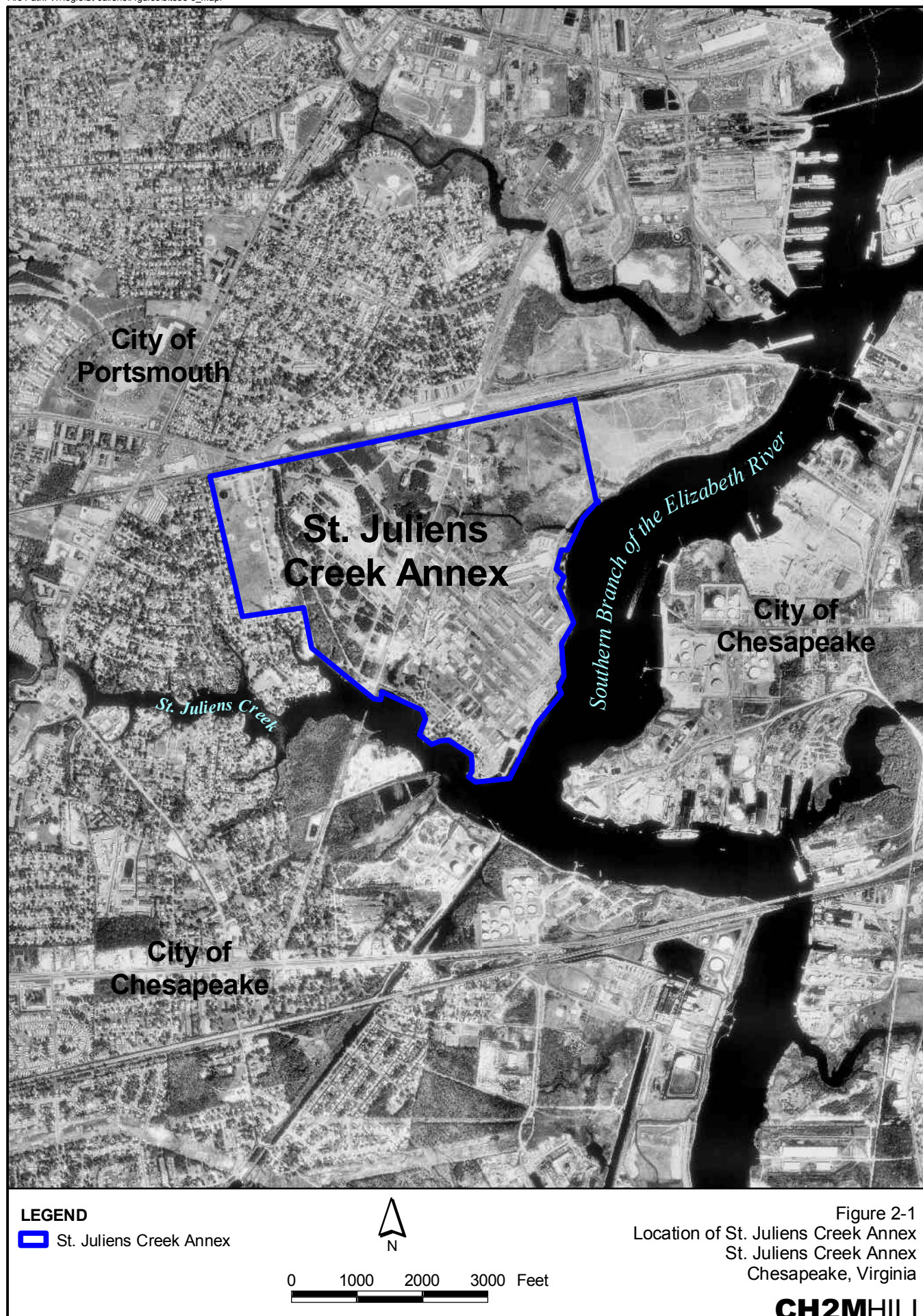
RFA No.	ADDITIONAL AOC/SWMU DESCRIPTION	CURRENT STATUS	PREVIOUS ACTION	ADDITIONAL ACTION
AOC G	Buildings 55, 56, & 57 (Inert and Explosive Loaded Item Storage facilities as Category 2 for building decontamination)	All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings. Buildings 55 and 56 are located in the historic district.
AOC G	Buildings 59, 60, 61, 64, 65, 66, 67, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, & 84 (Explosive Loaded Items and Smokeless Powder Storage Magazines)	All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition. Demolition planned for Buildings 64, 65, 66, and 67; date unknown.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings.
AOC G	Buildings 86, 87, & 88 (Explosive Item Storage- no exposed explosives)	All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings.
AOC G	Buildings 161 & 162 (Bulk Hi-Explosives Support Buildings)	All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings.
AOC G	Buildings 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, & 198 (Hi-Explosive Item Storage and Smokeless Powder Storage)	All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings.
AOC G	Building 185 Bag Loading operations/Ammunition Breakdown	DEMOLISHED (1985-1990)*	Decontamination of Building 185 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	After building 185 was decontaminated in the 1970s, it was used for OCFS administration spaces prior to demolition between 1985-1990. The Navy plans no further action (NFA) for Building 185.
AOC G	Building 193	DEMOLISHED (after 1990)*	Decontamination of Building 193 occurred in the mid 1970s; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance	Building 193 was demolished after 1990. The Navy plans no further action (NFA) for Building 193.
AOC G	Building 218, 219, & 220 (Black Powder Quilting Support Buildings)	All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings.
AOC G	Building 227 Ordnance (hardware) degreasing	DEMOLISHED (1982-1985)*	Spent solvents from this operation, ordnance (cartridge) degreasing at Buildings 227 & 190 were reportedly disposed of at the Burning Grounds (Site 5)	Site 5 is under investigation (RI); contamination from this source will be identified and addressed in future actions taken at Site 5. Building 227 was demolished between 1982-1985; The Navy plans no further action (NFA) for Building 227.
AOC G	Building 240	DEMOLISHED (1998)	Decontamination of Building 240 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 240 was demolished in 1998. The Navy plans no further action (NFA) for Building 240.
AOC G	Building 241	DEMOLISHED (after 1990)*	Decontamination of Building 241 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 241 was demolished after 1990. The Navy plans no further action (NFA) for Building 241.
AOC G	Building 242	DEMOLISHED (after 1990)*	Decontamination of Building 242 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 242 was demolished since 1990. The Navy plans no further action (NFA) for Building 242.
AOC G	Building 243	DEMOLISHED (after 1990)*	Decontamination of Building 243 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 243 was demolished since 1990. The Navy plans no further action (NFA) for Building 243.
AOC G	Building 244	DEMOLISHED (1982-1985)*	Decontamination of Building 244 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 244 was demolished between 1982-1985. The Navy plans no further action (NFA) for Building 244.
AOC G	Building 245	DEMOLISHED (1982-1985)*	Decontamination of Building 245 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 245 was demolished between 1982-1985. The Navy plans no further action (NFA) for Building 245.
AOC G	Building 246	DEMOLISHED (1982-1985)*	Decontamination of Building 246 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 246 was demolished between 1982-1985. The Navy plans no further action (NFA) for Building 246.

RFA No.	ADDITIONAL AOC/SWMU DESCRIPTION	CURRENT STATUS	PREVIOUS ACTION	ADDITIONAL ACTION
AOC G	Building 256	DEMOLISHED (1986-1990)*	Decontamination of Building 256 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 256 was demolished between 1986-1990. The Navy plans no further action (NFA) for Building 256.
AOC G	Building 267	DEMOLISHED (1982-1985)*	Decontamination of Building 267 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 267 was demolished between 1982-1985. The Navy plans no further action (NFA) for Building 267.
AOC G	Building 272 Pyrotechnics Renovation Plant	DEMOLISHED (1991)	Building 272 was not identified as requiring decontamination by the Naval Ammunition Production Engineering Center (NAPEC) in the assessment of St. Juliens Creek Annex.	Building 272 is within the area being investigated as part of the Burning Grounds (Site 5) which is under investigation (RI); contamination from this source will be identified and addressed in the future actions taken at Site 5. The Navy plans no further action (NFA) for Building 272.
AOC G	Building 277 Q.E. Lab	no data	Decontamination of X-ray test cells in Building 277 and support magazine, Building 358; Nava Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 277 was decontaminated in the 1970s, it has been used as a communicator center. The Navy plans no further action (NFA) for Building 277.
AOC G	Building 358	DEMOLISHED	Decontamination of X-ray test cells in Building 277 and support magazine, Building 358; Nava Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 358 was decontaminated in the 1970s, it has been used as a transmitter building. The Navy plans no further action (NFA) for Building 358.
AOC I	Wharf Area Ordnance Dumping	NFA	Area examined/searched by EOD divers in the 1970s. Pier area is certified as decontaminated at the single "X" level. Additional action is required if area transferred to non-DOD entities.	AOC I is under investigation as IRP Site 21.
AOC J	Building 12	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) assessment of Building 12 determined tha decontamination of this building was not required.	The Navy plans no further action (NFA) for Building 12
AOC J	Building 14	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) assessment of Building 14 determined tha decontamination of this building was not required.	The Navy plans no further action (NFA) for Building 14.
AOC J	Building 43	DEMOLISHED (after 1990)*	Decontamination of Building 43 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 43 was demolished since 1990. The Navy plans no further action (NFA) for Building 43.
AOC J	Building 89 (1908-1970s)	DEMOLISHED (1991)	Decontamination of Building 89 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 89 was decontaminated in the 1970s, it has been used for storage. It is currently vacant and planned for demolition in FY-00. The Navy plans no further action (NFA) for Building 89.
AOC J	Building 184 Primer Renovation Facility	DEMOLISHED (1985-1986)*	Decontamination of Building 184 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 184 was demolished between 1985-1986.The Navy plans no further action (NFA) for Building 184.
AOC J	Building 188 (1940s-1970) Pyrotechnic loading	DEMOLISHED	Decontamination of Building 188 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 188 was decontaminated in the 1970s, it has been used for storage. It is currently vacant and planned for demolition in FY-00. The Navy plans no further action (NFA) for Building 188.
AOC J	Building 190 (1940s-1970s) Medium Caliber Loading/Renovation Plant/Degreasing	DEMOLISHED (1991)	Decontamination of Building 190 (including surrounding area and under building) and process equipment Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination. Spent solvents from this operation, ordnance (cartridge) degreasing, at Building 190 (and 227 were reportedly disposed of at the Burning Grounds (Site 5).	Since Building 190 was decontaminated in the 1970s, it has been used for storage. It was demolished in 2001. The Navy plans no further action (NFA) for Building 190. Site 5 is under investigation (RI); contamination from this source will be identified and addressed in future actions taken at site 5.
AOC J	Building 222 Ammunition Steam Out	DEMOLISHED (after W.W.II)	Building 222 (Victory Building) demolished after W.W.II. The former location is directly adjacent to Site 5 and the berm running along the mid-section of Blows Creek.	Residual contamination from Building 222 will be investigated as part of the RI underway for Site 5. Contamination from this source will be identified and addressed in future actions. The Navy plans no further action (NFA) for Building 222.
AOC J	Building M-3 Mark VI mine loading facility/ Steam out	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Decontamination of Building M-3 occurred in the mid 1970s; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination	Since Building M-3 was decontaminated in the 1970s, it has been used for storage. It is currently vacant and planned for demolition, although the demolition has not been programmed for a specific FY. The Navy plans no further action (NFA) for Building M-3.
AOC J	Building M-4 Mark VI mine loading facility/ Steam out	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Decontamination of Building M-4 occurred in the mid 1970s; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination	Since Building M-4 was decontaminated in the 1970s, it has been used for storage. It is currently vacant and planned for demolition, although the demolition has not been programmed for a specific FY. The Navy plans no further action (NFA) for Building M-3.

RFA No.	ADDITIONAL AOC/SWMU DESCRIPTION	CURRENT STATUS	PREVIOUS ACTION	ADDITIONAL ACTION
AOC J	Building M-5 Mark VI mine loading facility/ Steam out	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Decontamination of Building M-5 occurred in the mid 1970s; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination	Since Building M-5 was decontaminated in the 1970s, it has been used for storage. It is currently vacant and planned for demolition, although the demolition has not been programmed for a specific FY. The Navy plans no further action (NFA) for Building M-3.
AOC J	Building M-5 Annex Medium Caliber Projectile Washout Plant	DEMOLISHED (1982-1985)*	Decontamination of Building M-5 Annex (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building M-5 Annex was demolished between 1982 and 1985. The Navy plans no further action (NFA) for Building M-5 Annex.
AOC K	Former Waste Water Treatment Plant	Building 318 Demolished	Small sewage treatment plant (Building 318) treated wastewater from the barracks from 1942 to 1947. The barracks were demolished in 1947, and use of the plant was discontinued.	Available information pertaining to this location and recommendations for additional action for AOC K are included in the Site Screening Assessment report.
SWMU 11	Building 163  NBC Agents Storage area	Under RCRA Closure	Building 163 is a magazine bunker and has been used for storage of non-ordnance materials. Currently Building 163 is under RCRA Closure for hazardous waste storage >90 days. This VDEQ enforcement is with the Norfolk Naval Shipyard.	The Navy plans no further action (NFA) for Building 163.
SWMU 31	Drainage Swales (along Building 13) Ammunition Degreasing Building 47	Demolition Planned date unknown	The drainage swale identified as SWMU # 31 has been filled and paved since the 1940s; the recipient water body (tidal marsh) is the low lying area of Landfill B.	Landfill B (Site 2) is under investigation (RI); contamination from this source will be identified and addressed in future actions taken at Site 2. The Navy plans no further action (NFA) for SWMU #13.
N/A	Septic Drainage Field-Southeast of Building 269	DEMOLISHED (after 1990)*	Septic tank and tile field associated with Building 269 (constructed as a latrine). Per a Sanitary Facilities Survey of SJCA in 1963, this was the only active septic tank and tile field at SJCA. No reported or known releases of hazardous materials have occurred at this location.	The Navy plans no further action (NFA) for this location.
N/A	Septic Drainage Field-Southeast of Building 305	no data	Septic tank and tile field associated with Building 305 (constructed as a gatehouse with latrine facilities). Per a Sanitary Facilities Survey of SJCA in 1963, Building 305 latrine facilities discharge to the sanitary sewer. No reported or known releases of hazardous materials have occurred at this location.	The Navy plans no further action (NFA) for this location.

\* Based on Review of EPIC Study of Photography









**LEGEND**

- Sites in the CERCLA RI/FS Process
- Preliminary Screening Areas (FFA Appendix B)

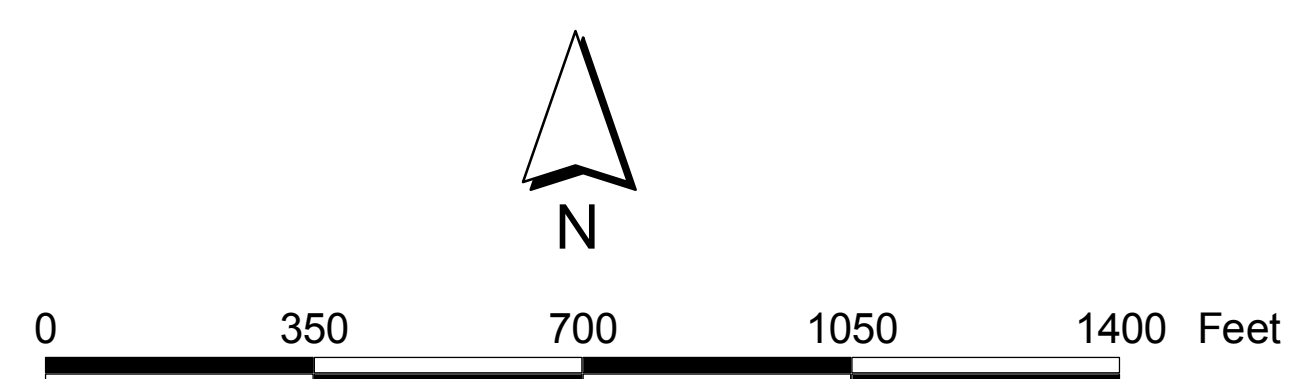
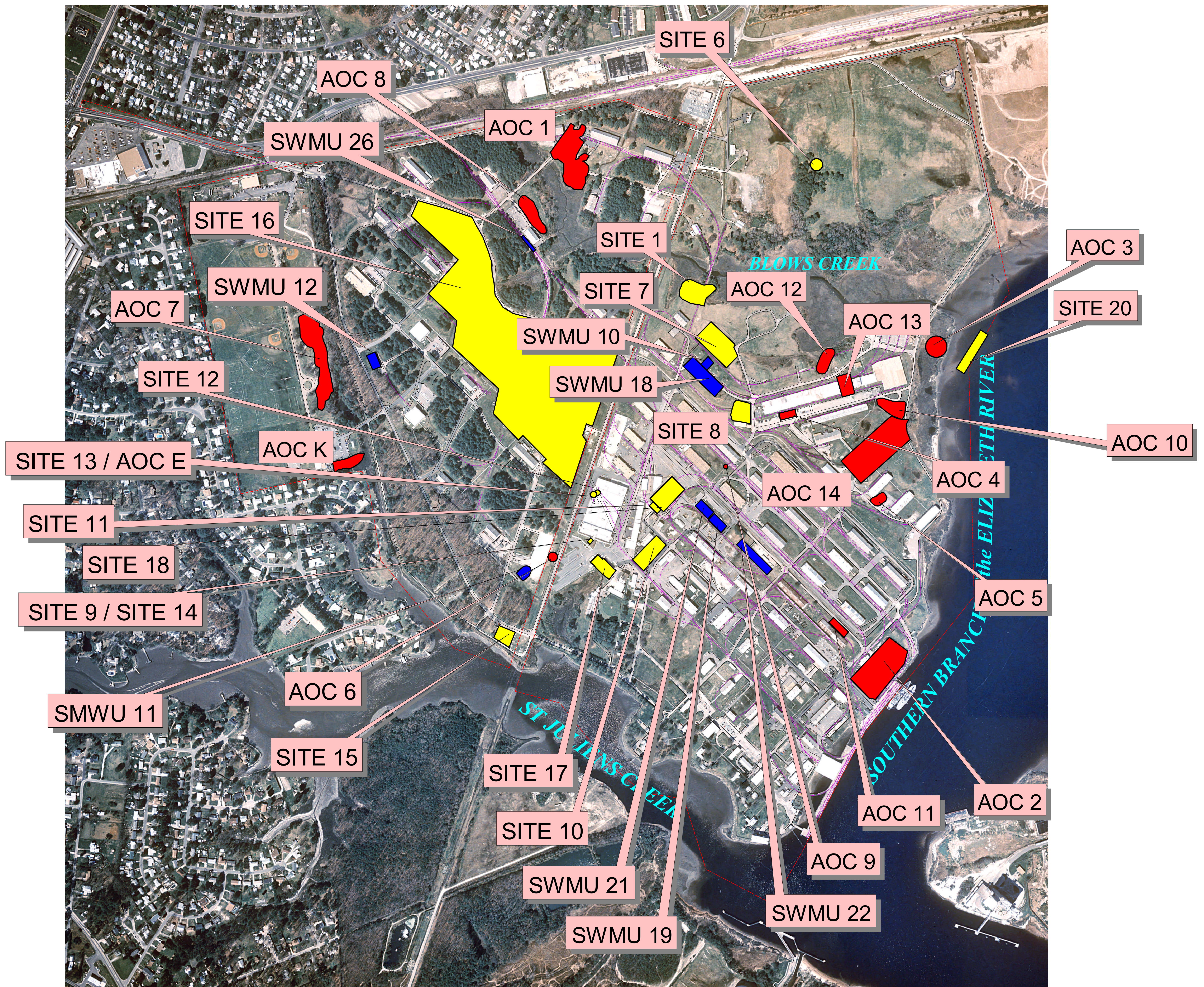


Figure 2-2  
Further Action Sites Location Map  
St. Juliens Creek Annex  
Chesapeake, Virginia





LEGEND

- AOCs
- Sites
- SWMUs

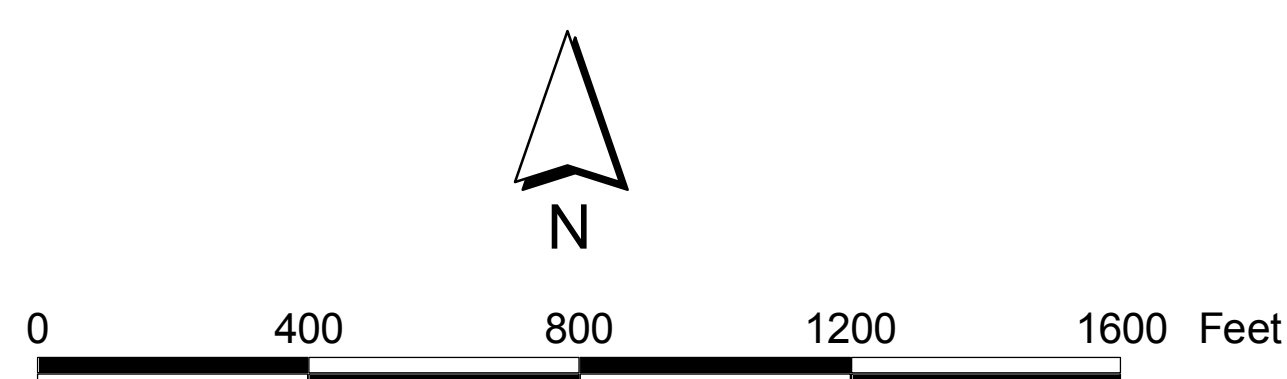


Figure 2-3  
No Further Action Sites, SWMUs, and AOCs Location Map  
St. Juliens Creek Annex  
Chesapeake, Virginia



## Proposed Activities for FYs 2005 through 2009

---

This section summarizes ongoing and planned IR/CERCLA activities at each site. The discussion focuses on activities that are proposed for FYs 2005 through 2009. Additional activities may be identified during or as a result of the execution of the activities described herein. Subsection 3.1 discusses multisite and basewide activities, and Subsection 3.2 describes site-specific characterization, remediation, long-term monitoring, and maintenance activities. The schedule for all activities discussed below depends on the availability of funding.

### 3.1 Multisite and Basewide Activities for FYs 2005 through 2009

The basewide activities planned for FYs 2005 through 2009 are discussed below and a 5-year schedule is presented in Section 5.

#### 3.1.1 Preparation of the SMP Update for FYs 2006 through 2010

The SMP is a working document that is updated yearly to maintain up-to-date documentation and a summary of environmental actions at SJCA. The SMP will meet the requirements of the pending FFA under the CERCLA and be used as a management tool by the SJCA IR Partnering Team and their respective organizations (LANTDIV, SJCA, USEPA, and VDEQ) in the planning and scheduling of environmental remedial response activities.

#### 3.1.2 Blows Creek Watershed Baseline Ecological Risk Assessment

A BERA for Blows Creek was conducted in September 2003 to assess potential ecological risk in Blows Creek associated with adverse effects from Navy IR sites as well as other potential non-Navy sources. The results were submitted in a Draft BERA Report in June 2004 recommending a Phase II investigation, including tissue sampling in Blows Creek and surface sediment sampling to fully evaluate the potential source from the Southern Branch of the Elizabeth River, to be implemented in FY 2005. The BERA sampling results will be used to assess the impact to the Blows Creek watershed, recommend further action, and develop remedial goals, if warranted.

### 3.2 Site Characterization and Remediation Activities for FYs 2005 through 2009

#### 3.2.1 Site 2—Waste Disposal Area B

Expanded RI field activities were completed in January 2004. The activities planned at Site 2 for FYs 2005 through 2009 consist of:

- Further delineation of potentially contaminated groundwater and sediment
- Expanded RI Report

- FS
- EE/CA and Action Memorandum
- PRAP and ROD
- RD

### **3.2.2 Site 3—Waste Disposal Area C**

The activities planned at Site 3 for FYs 2005 through 2009 consist of:

- PRAP and ROD

### **3.2.3 Site 4—Landfill D**

The activities planned at Site 4 for FYs 2005 through 2009 consist of:

- RD
- Long-Term Monitoring Plan

### **3.2.4 Site 5—Burning Grounds**

Expanded RI field activities were completed in January 2004. The activities planned at Site 5 for FYs 2005 through 2009 consist of:

- Expanded RI Report
- FS
- EE/CA and Action Memorandum
- PRAP and ROD
- RD

### **3.2.5 Site 19—Wharf Area Building 190**

The Final SI report was completed in June 2004 recommending further evaluation as part of a Supplemental SI. The activities planned at Site 19 for FYs 2005 through 2009 consist of:

- Supplemental SI Work Plan
- Field Investigation to further delineate potentially contaminated soil and groundwater
- Supplemental SI Report
- EE/CA and Action Memorandum
- NTCRA
- PRAP and ROD
- RD

### **3.2.6 Site 21—Soil Staining at Building 187**

The Final SI report was completed in June 2004 recommending further evaluation as part of a Supplemental SI. The activities planned at Site 21 for FYs 2005 through 2009 consist of:

- Supplemental SI Work Plan
- Field Investigation to further delineate VOCs in groundwater
- Supplemental SI Report
- Pilot Study or Treatability Study

## Remedial Actions and Removal Actions

---

Remedial Actions (RAs) are conducted to prevent a potential release of contaminants and/or further migration of contaminants. Removal actions are taken to prevent immediate and substantial harm to human health. Examples include the removal of drums or tanks, or removal of contaminated soils.

Historic and proposed remedial and removal actions that have been conducted or identified at SJCA sites are presented below, listed according to site the Navy will continue to identify possible remedial and removal actions as investigation activities proceed.

### 4.1 Historic Remedial Actions and Removal Actions

#### 4.1.1 Site 3—Waste Disposal Area C

Phase I of a NTCRA was implemented at Site 3 in FY 2002 to remove visible burned/stained soil and debris, as well as surrounding material posing a potential risk to human health and the environment. The extent of the area removed included 3,300 CY of waste and soil. A Construction Closeout Report documented completion of the Phase I IRA (OHM/SHAW, 2003) and the confirmation sample results were presented in a removal summary report (CH2M HILL, 2003a). The Phase II NTCRA to remove the remaining waste, soil, and upland ditch soil at Site 3 was completed in FY 2004. Approximately 9,497 CY of waste and soil was removed during the excavation. Backfill was placed in the excavation and the surface soil will be seeded to restore the site to its original condition. A Construction Closeout Report documented completion of the Phase II IRA (JV I, 2004) and a Draft Confirmation Closeout Report was submitted in May 2004 recommending NFA at Site 3. Based upon the complete removal of waste and soil at Site 3, a no-action PRAP and ROD will be initiated in FY 2005.

#### 4.1.2 Site 6—Small Arms Unit

A removal action was conducted at Site 6 in FY 2002 and included excavation of remnants of the Small Arms Unit, as well as surrounding material posing a potential risk to human health and the environment. All remnants of the concrete caged unit and associated soil, which amounted to approximately 180 CY, were removed during the NTCRA, and replaced with clean fill. Soils were excavated to approximately 7 ft deep in the center of the excavation and the outer edges were excavated to 1 ft. A Final Closeout Report was submitted in FY 2003, and the no-action PRAP and ROD were issued in July 2003; the ROD was signed in September 2003.

## 4.2 Proposed Remedial Actions and Removal Actions

### 4.2.1 Site 4—Landfill D

An FS was completed for Site 4 in March 2004 (CH2M HILL, 2004c) to evaluate potential remedial options to mitigate the risk posed by the site. Based on the comparative analysis conducted as part of the FS, soil cover and removal of contaminated sediment in the upland drainage ditch was selected as the recommended remedial alternative for Site 4. A PRAP and Preliminary RD were submitted in May 2004. A ROD and Final RD is planned for submittal in FY 2004. The RA, consisting of the installation a soil cover over the landfill contents, estimated at 1.5 million ft<sup>3</sup>, and the removal of contaminated sediment in the eastern drainage ditch will be implemented in FY 2005.

### 4.2.2 Site 5—Burning Grounds

It is anticipated that a remedial action will be implemented at Site 5 to remediate surface soil and waste materials. An FS and/or EE/CA will be prepared in FY 2005 to characterize the type and volume of material to be removed and provides costs for various removal action options.

### 4.2.3 Site 19—Wharf Area Building 190

It is anticipated that a removal action will be implemented at Site 19 in FY 2005 to remove several soil hot spots based on elevated inorganics and PAHs. An EE/CA will be prepared that characterizes the type and volume of material to be removed and provides costs for various removal action options.

## SECTION 5

# Site Management Schedules

---

This section presents the 5-year project schedules for basewide activities and each site discussed in Section 3 and for sites that will begin study, investigation, or remedial activities in FYs 2005 through 2009 (October 1, 2004, through September 30, 2009). These schedules are adjusted annually in the SMP, as future site activities are further defined and various administrative issues, including funding, are addressed. The project schedules may change depending on funding availability.

The project schedule for basewide and site-specific activities is presented in Figure 5-1. The review and comment periods were based on general FFA guidelines and flow charts depicting the process are included as Figures 5-2 through 5-4. The schedule derived from these guidelines assumes informal dispute resolution.

Figure 5-1  
St Juliens Creek Annex Schedule of IR Activities for Fiscal Years 2005 through 2009  
Site Management Plan

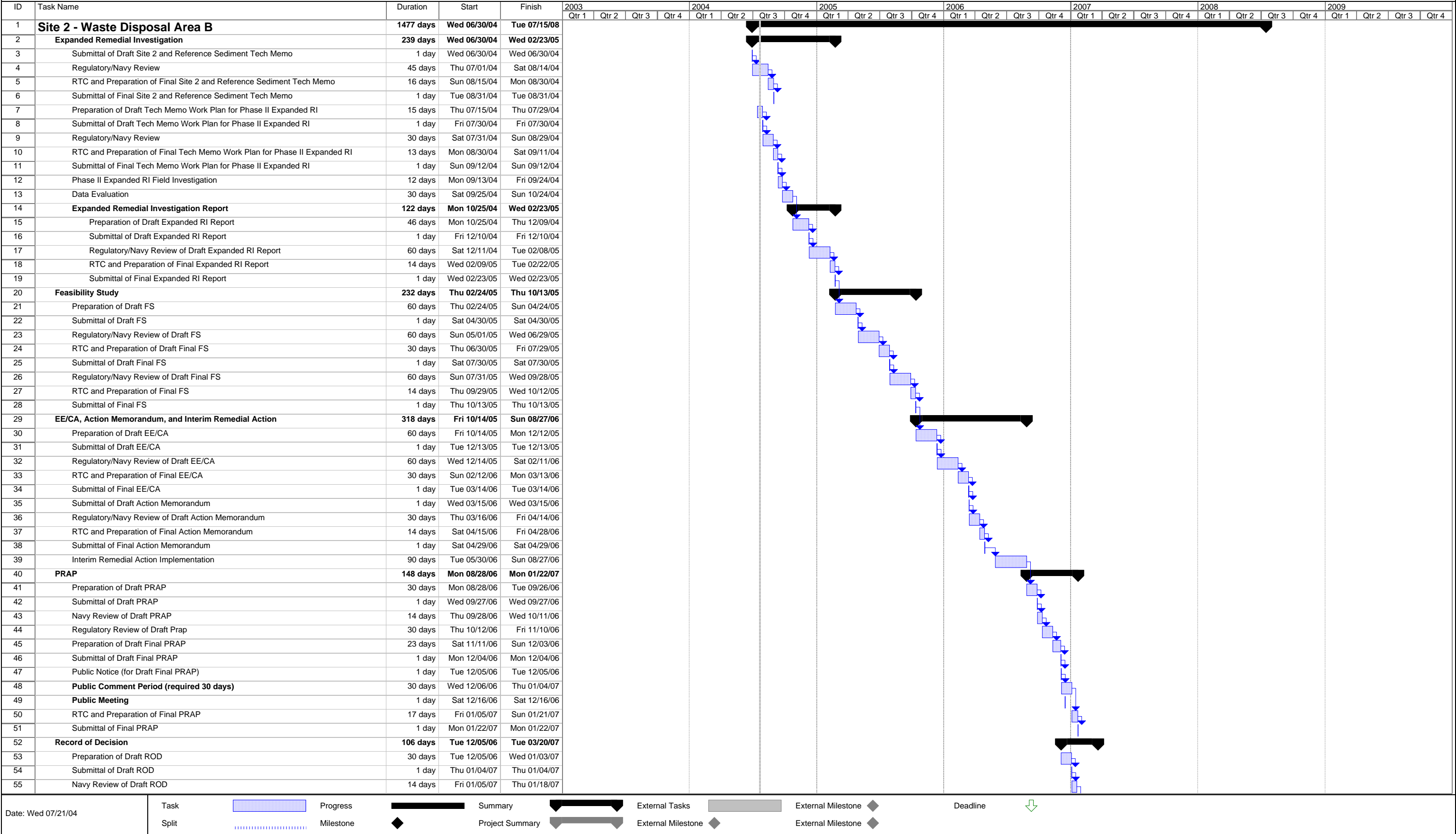


Figure 5-1  
St Juliens Creek Annex Schedule of IR Activities for Fiscal Years 2005 through 2009  
Site Management Plan

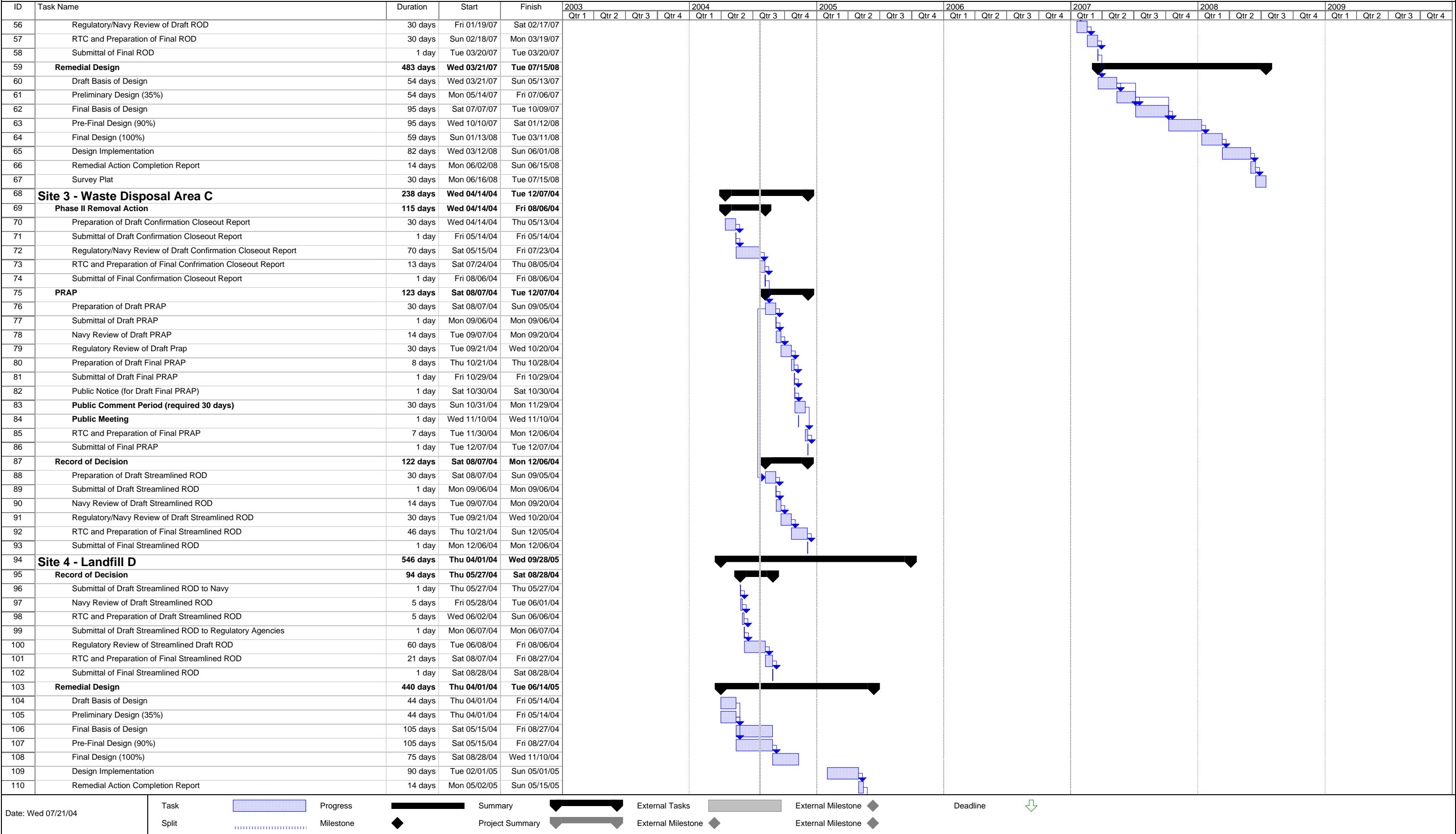
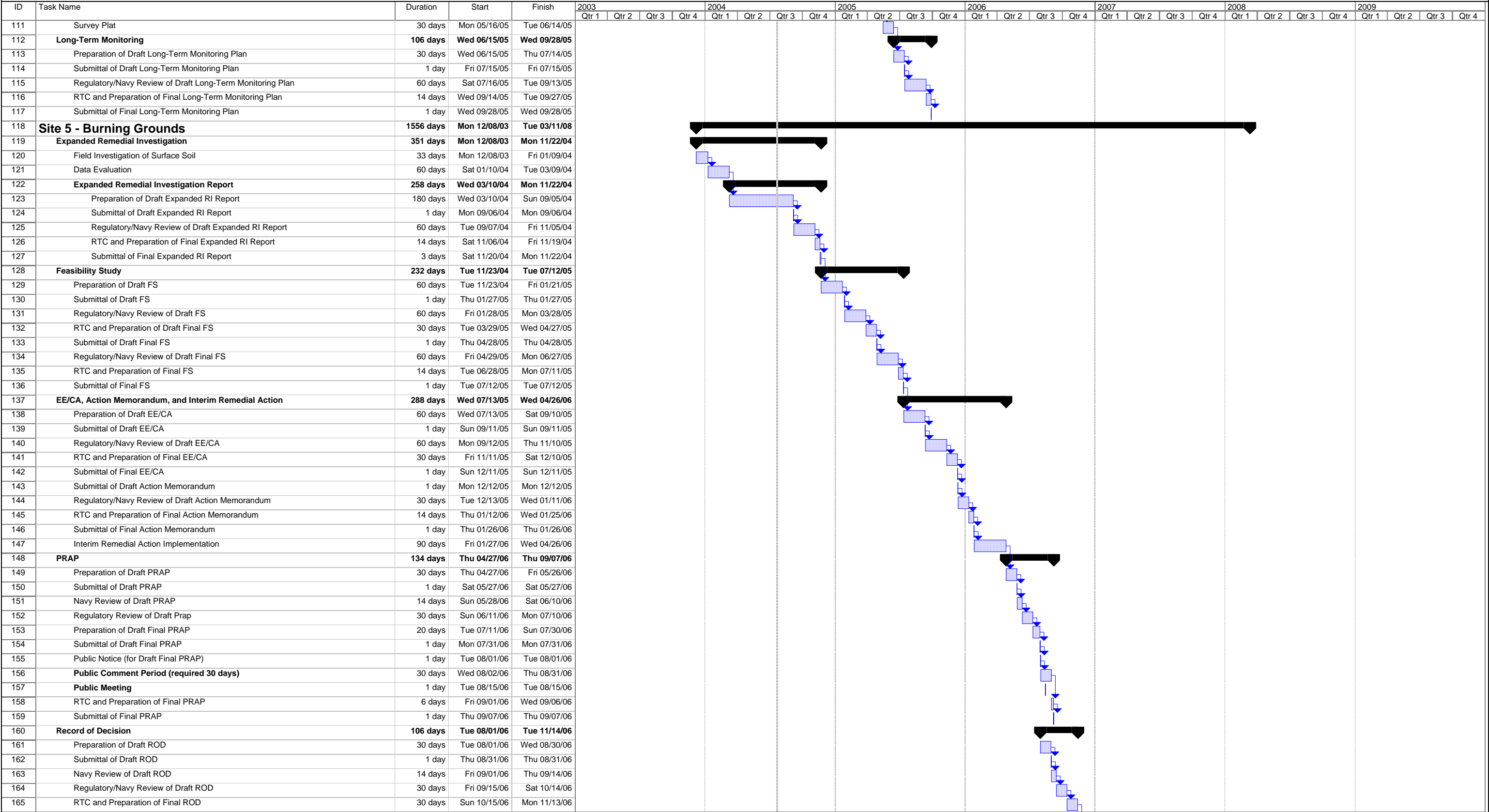


Figure 5-1  
St Juliens Creek Annex Schedule of IR Activities for Fiscal Years 2005 through 2009  
Site Management Plan



Date: Wed 07/21/04

Task

Progress

Summary

External Tasks

External Milestone

Deadline

Split

Milestone

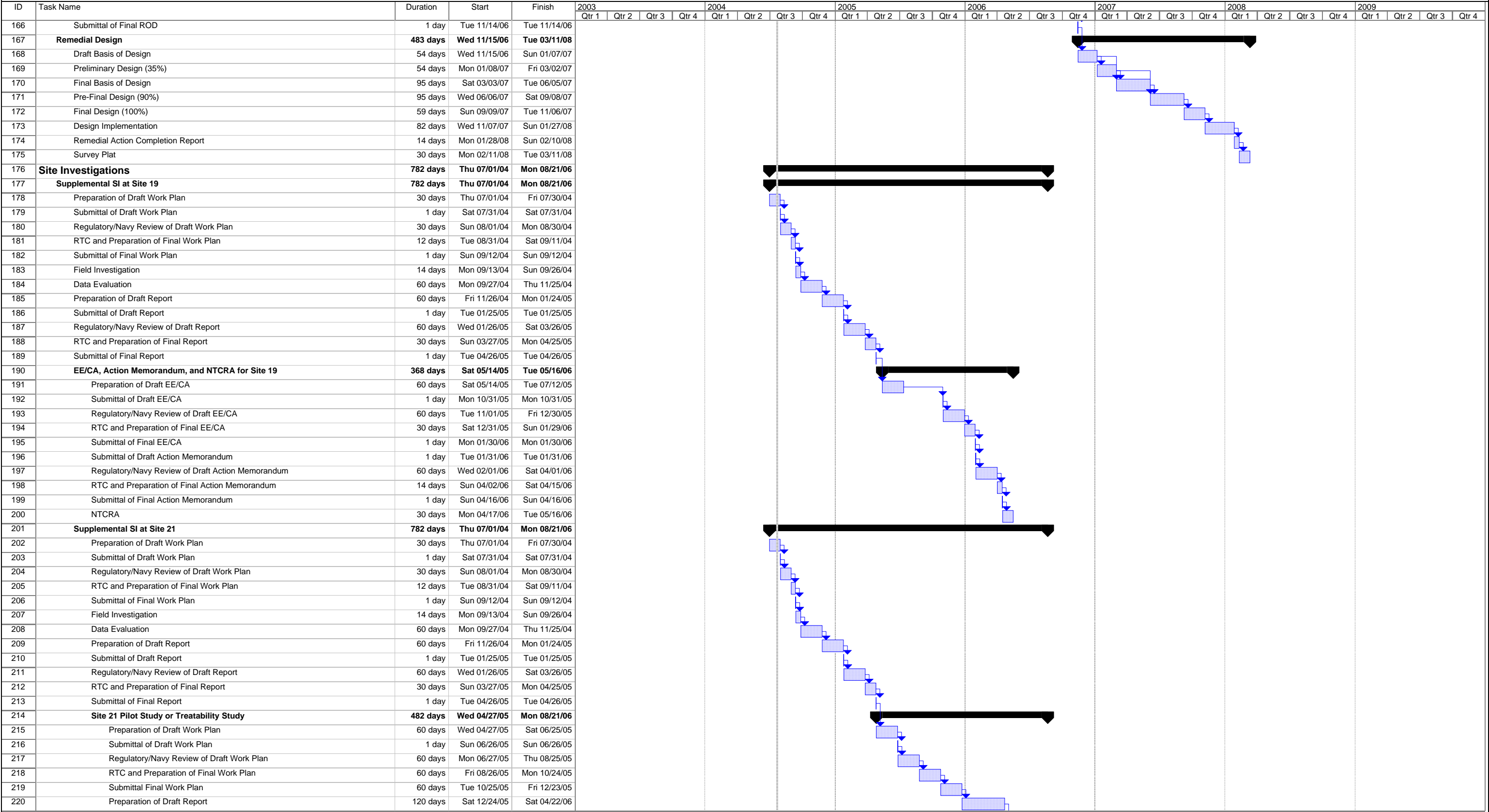
Project Summary

External Milestone

External Milestone



Figure 5-1  
St Juliens Creek Annex Schedule of IR Activities for Fiscal Years 2005 through 2009  
Site Management Plan



Date: Wed 07/21/04

Task

Progress

Summary

External Tasks

External Milestone

Deadline

Split

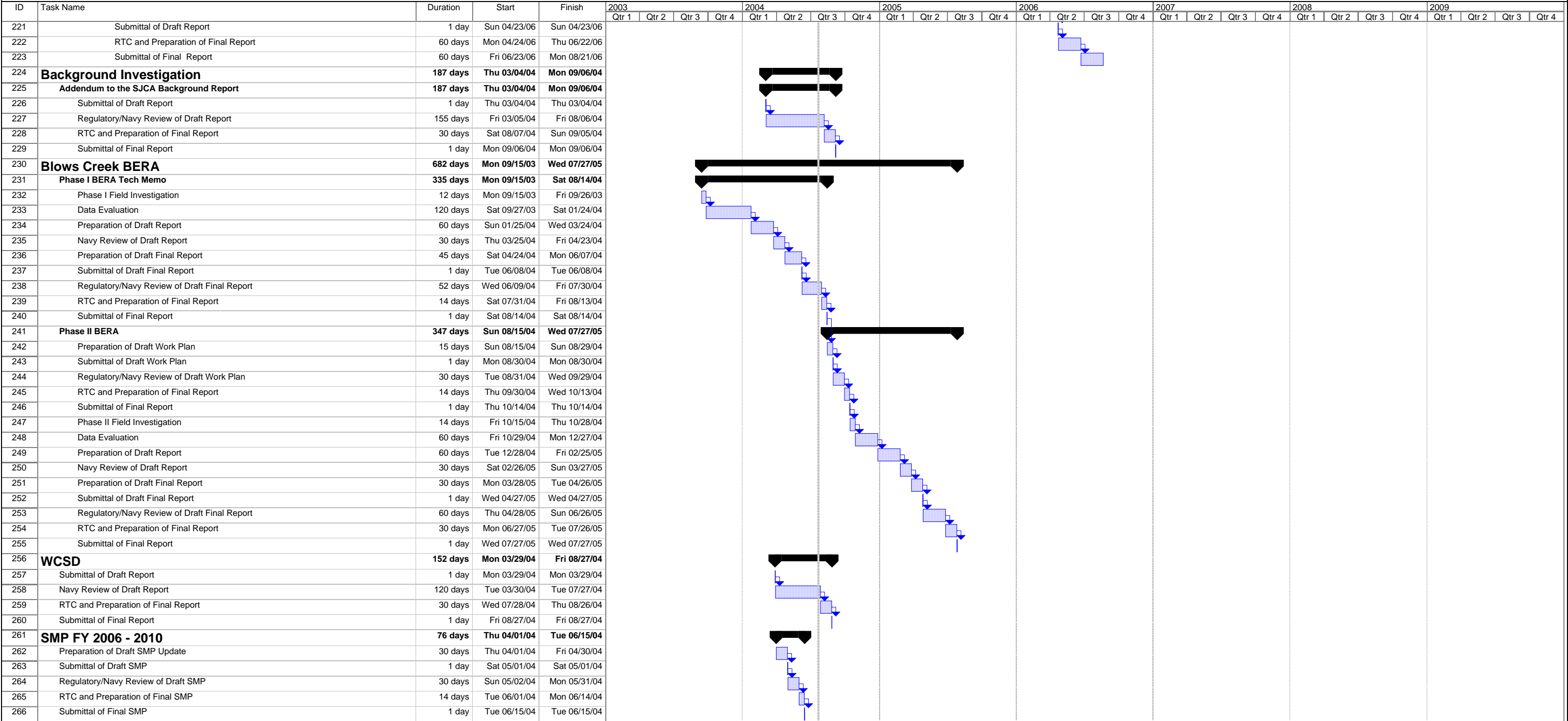
Milestone

Project Summary

External Milestone

External Milestone

Figure 5-1  
St Juliens Creek Annex Schedule of IR Activities for Fiscal Years 2005 through 2009  
Site Management Plan



Date: Wed 07/21/04

Task



Progress



Summary



External Tasks



External Milestone

Deadline

Split



Milestone



Project Summary

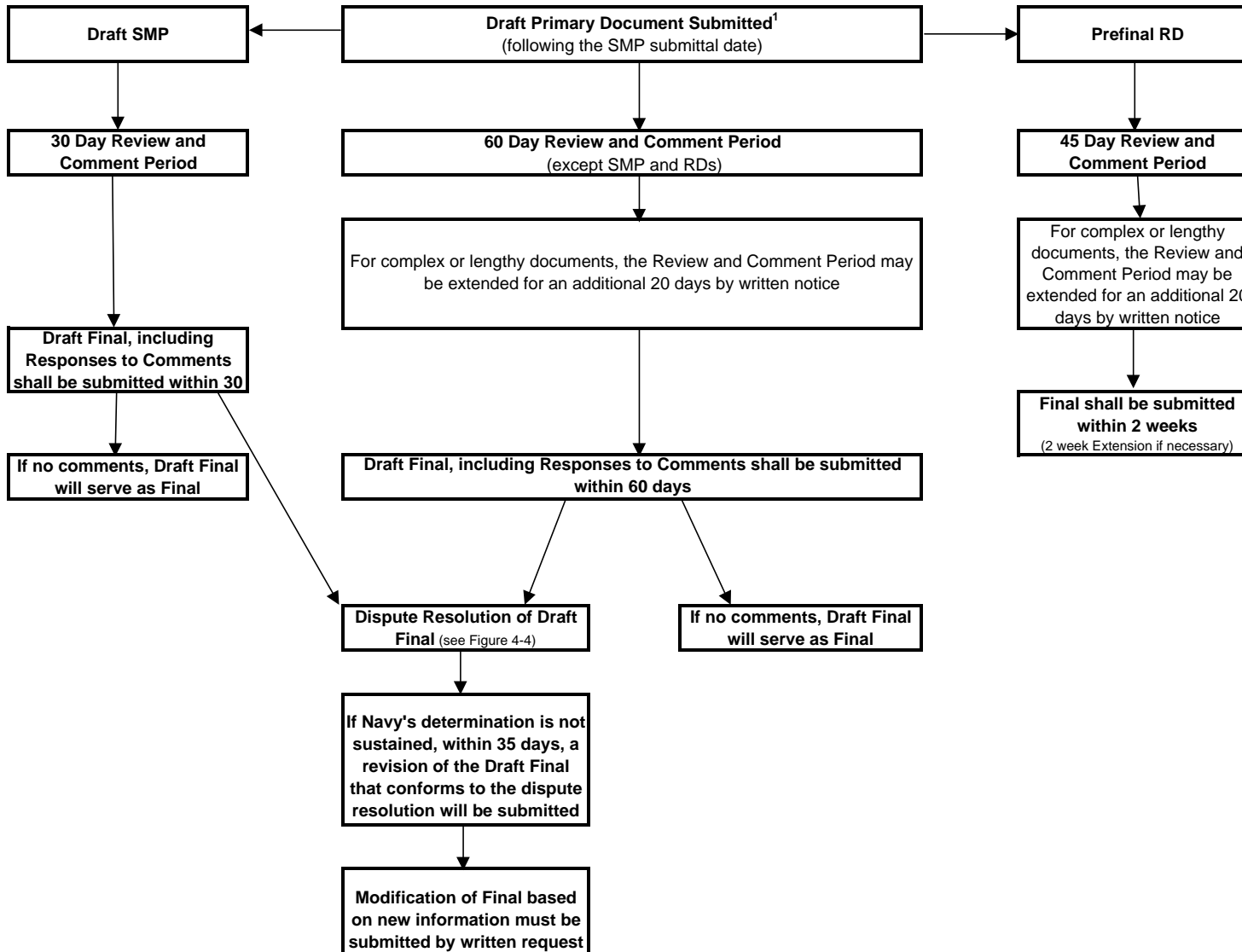


External Milestone

External Milestone

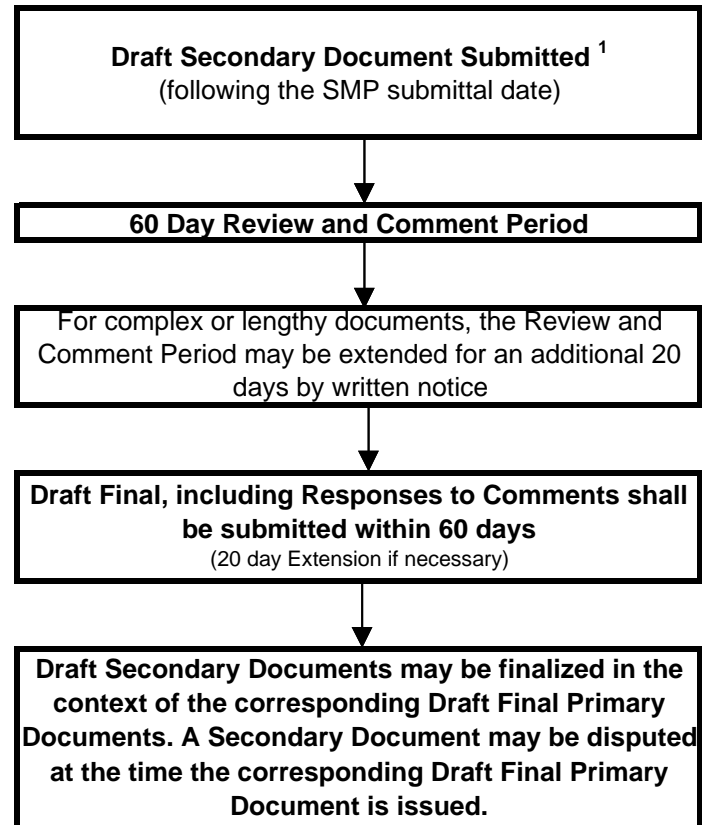
Note: The review and submittal dates are based on the FFA Process Flow Charts or dates previously agreed upon and assume informal dispute resolution of Draft Final documents within a reasonable number of days.

**Figure 5-2**  
**Primary Document Submittal Flow Chart**  
**FFA Process**  
**St. Juliens Creek Annex**  
**Chesapeake, Virginia**



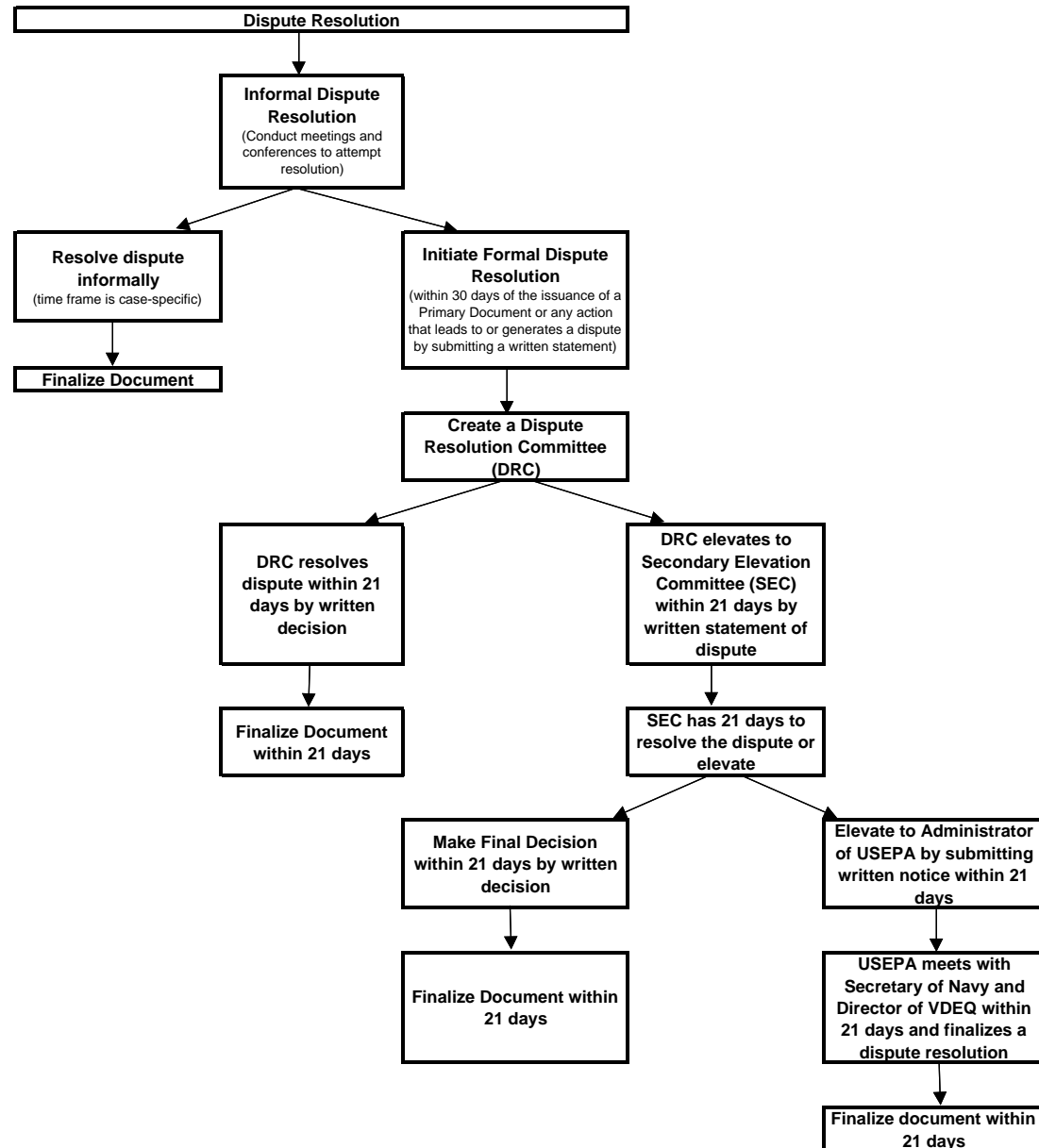
<sup>1</sup>SJCA Primary Documents Include: Remedial Investigation (RI)/Feasibility Study (FS)/Focused Feasibility Study (FFS) Work Plans, RI Reports, FS and FFS Reports, Proposed Remedial Action Plans (PRAPs), Records of Decision (RODs), Final Remedial Designs (RDs), Remedial Action Work Plans, Remedial Action Completion Reports (RACRs), and Site Management Plans (SMPs)

**Figure 5-3**  
**Secondary Document Submittal Flow Chart**  
**FFA Process**  
**St. Juliens Creek Annex**  
**Chesapeake, Virginia**



<sup>1</sup>SJCA Secondary Documents Include: Health and Safety Plans (HSPs), Non-Time-Critical Removal Action (NTCRA) Plans, Pilot/Treatability Study Work Plans and Reports, Engineering Evaluation/Cost Analysis (EE/CA) Reports, Well Closure Methods and Procedures, Preliminary/Conceptual Designs or equivalents, Prefinal Remedial Designs (RDs), Periodic Reviews/5-Year Review Assessment Reports, Removal Action Memorandums, Preliminary Closeout Reports (PCORs)/Final Closeout Reports (FCORs)

**Figure 5-4**  
**Dispute Resolution Flow Chart**  
**FFA Process**  
**St. Juliens Creek Annex**  
**Chesapeake, Virginia**



# References

---

A.T. Kearney, Inc., and K.W. Brown and Associates, Inc. (A.T. Kearney), 1989. *Phase II RCRA Facility Assessment of the St. Juliens Creek Annex Facility*, Chesapeake, Virginia. March 1989.

CDM Federal, 1999a. *Final Supplemental Field Investigation Plan Landfill C and Landfill D*. St. Juliens Creek Annex Site. Chesapeake, Virginia. Prepared for the Department of the Navy Atlantic Division Naval Facilities Engineering Command. Norfolk, Virginia. March 1999.

CDM Federal, 1999b. *Final Supplemental Field Investigation Plan Landfill B and the Burning Grounds*. St. Juliens Creek Annex Site. Chesapeake, Virginia. Prepared for the Department of the Navy Atlantic Division Naval Facilities Engineering Command. Norfolk, Virginia. March 1999.

CH2M HILL, 1996. *Final Relative Risk Ranking System Data Collection Report*. St. Juliens Creek Annex to the Norfolk Naval Base, Chesapeake, Virginia, April 1996.

CH2M HILL, 2001b. *Final Background Investigation Report*. St. Juliens Creek Annex, Chesapeake, Virginia. October 2001.

CH2M HILL, 2002a. *Final Site Screening Assessment Report*. St. Juliens Creek Annex, Chesapeake, Virginia. April 2002.

CH2M HILL, 2002b. *Final Engineering Evaluation/Cost Analysis for Sites 3 and 6*. St. Juliens Creek Annex, Chesapeake, Virginia. June 2002.

CH2M HILL, 2002c. *Final Action Memorandum for Sites 3 and 6*. St. Juliens Creek Annex, Chesapeake, Virginia. August 2002.

CH2M HILL, 2003a. *Final Site 6 Closeout Report and Site 3 Removal Summary*. St. Juliens Creek Annex, Chesapeake, Virginia. March 2003.

CH2M HILL, 2003b. *Final Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment Report for Sites 3, 4, 5, and 6*. St. Juliens Creek Annex, Chesapeake, Virginia. March 2003.

CH2M HILL, 2003c. *Final Work Plan for Baseline Ecological Risk Assessment (Step 4) Blows Creek Sites 3, 4, 5, and 6*. St. Juliens Creek Annex, Chesapeake, Virginia. August 2003.

CH2M HILL, 2003d. *Final Site Management Plan Fiscal Years 2004 through 2009*. St. Juliens Creek Annex, Chesapeake, Virginia. September 2003.

CH2M HILL, 2003e. *Final Work Plan Site Screening Assessment Addendum for Site 8 and AOCs 13, 14, and K and Site Investigations at Site 19, Site 21, and AOC 1*. St. Juliens Creek Annex, Chesapeake, Virginia. September 2003.

CH2M HILL, 2003f. *Final Work Plan for the Expanded Remedial Investigation at Sites 2 and 5*. St. Juliens Creek Annex, Chesapeake, Virginia. December 2003.

CH2M HILL, 2004a. *Final Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment Report for Site 2*. St. Juliens Creek Annex, Chesapeake, Virginia. February 2004.

CH2M HILL, 2004b. *Draft Background Investigation Report Addendum for Groundwater*. St. Juliens Creek Annex, Chesapeake, Virginia. March 2004.

CH2M HILL, 2004c. *Final Feasibility Study for Site 4*. St. Juliens Creek Annex, Chesapeake, Virginia. March 2004.

CH2M HILL, 2004d. *Final Site Screening Assessment Addendum*. St. Juliens Creek Annex, Chesapeake, Virginia. June 2004.

CH2M HILL, 2004e. *Final Site Investigation Report for Sites 8, 19, 21, and AOC 1*. St. Juliens Creek Annex, Chesapeake, Virginia. June 2004.

Department of Defense (DoD), 2004. *Final Federal Facilities Agreement*. St. Juliens Creek Annex, Chesapeake, Virginia. March 2004, signed July 2004.

JV I (AGVIQ-CH2M HILL Joint Venture I), 2004. *Construction Closeout Report, Interim Remedial Action (Phase II) at Site 3*. St. Juliens Creek Annex, Chesapeake, Virginia. March 2004.

Navy Engineering and Environmental Support Activity (NEESA), 1981. *Navy Assessment and Control of Installation Pollutants: Initial Assessment Study of St. Juliens Creek Annex, Norfolk Naval Shipyard, Portsmouth, Virginia*. NEESA 13-001. August 1981.

NUS Corporation, Superfund Division (NUS), 1983. *Preliminary Assessment*. 1983.

OHM/SHAW, 2003. *Remedial Action Construction Closeout Report RAC Action*. St. Juliens Creek Annex, Chesapeake, Virginia. January 2003.

Tetra Tech, 1999. *Sampling Plan for St. Juliens Creek Annex, Chesapeake City, Virginia*. January 1999.

Tetra Tech, 2000. *Hazard Ranking System Documentation Record for St. Juliens Creek Annex (U.S. Navy)*, Chesapeake City, Virginia. January 2000.

USEPA, 1995. *Aerial Photographic Site Analysis, Norfolk Naval Shipyard: Annex Areas, Norfolk, Virginia*. February 1995.